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ABSTRACT

This study sought to develop a valid set of scales in the cognitive and affective domains for measuring the quality of life of university students. In addition the study attempted to illustrate the usefulness of Thomas Piazza's procedures for constructing valid scales in educational research. Piazza's method involves a multi-step construction of unidimensional scales. The theoretical framework for the model was linked to socialization theory and effective teaching theory and identified the cognitive and affective domains as being the fundamental characteristics of teaching and learning in universities. The study used a self-administered questionnaire completed by 301 undergraduate and 502 graduate students. Using procedures for constructing unidimensional scales for measuring dimensions of the affective domain suggested reconceptualization of the framework which yielded four more valid scales. These scales were applied to the analysis of cognitive domains which finally resulted in development of 12 items that created scales with a minimal amount of non-random error in three scales: Methodology of Teaching, Development of Pupils, and Subject Expertise. Includes 16 tables, 7 figures. Contains 95 references. (JB)

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RESEARCH MONOGRAPHS

1

Measuring the Quality of Life of University Students

Centre for Higher Education Research and Development
University of Manitoba

Fall 1991

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RESEARCH MONOGRAPH SERIES

Volume 1

Measuring the Quality of Life of University Students

Lance W. Roberts and Rodney A. Clifton

Fall 1991

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EDITOR

The Centre for Higher Education Research and Development is pleased to signal with this publication the initiation of a **Research Monographs** series. This new series reflects a central mandate of the CHERD, that of fostering and disseminating research related to postsecondary education. A number of policy statements in recent years – ranging from those which emerged from the 1987 National Forum on Postsecondary Education, to those appearing in the 1991 report of the Commission of Inquiry on Canadian University Education – have remarked on the dearth of solid research available to those attempting to study and manage the enormously expensive and complex enterprise of Canadian higher education. The Centre for Higher Education Research and Development has made this case itself, in its briefs to various such studies, and is attempting in its own programs and activities to do what it can to remedy the situation and to respond to what has so clearly been identified as a national need.

The Centre is particularly pleased to present as its first **Research Monograph** a study undertaken by two faculty members at the University of Manitoba, Professor Lance W. Roberts of the Department of Sociology, and Professor Rodney A. Clifton of the Department of Educational Administration and Foundations. Their work on **Measuring the Quality of Life of University Students** has already demonstrated its effectiveness and value at the University of Manitoba, in assistance of that institution's efforts at Departmental and Faculty reviews. Its application to other institutional settings will be just as valuable; as will be its significant contribution to the development of theory and methodology in this emerging and patently important area of inquiry.

Alexander D. Gregor
Editor, **Research Monographs**

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FOREWORD

About ten years ago we set aside some time from our mainstream work – longitudinal surveys of youth – to indulge an interest in the non-cognitive aspects of schooling. It was very much a part-time exercise. We noted the obvious emphasis in the literature on the cognitive outcomes of schooling, a somewhat atheoretical literature on school climate, and a well-developed tradition of quality of life research focussed on adults and only marginally concerned with education.

So, convinced of the importance of the notion of quality of life in schools, and somewhat unconvinced by existing school climate measures, we set about the development of a model and a measure of the quality of school life. And we did it by the book. A model was developed in some detail, drawing on the quality of life literature and on the creative theoretical work of Spady and Mitchell. The constructs were operationalized in the form of items that students could respond to, data were collected, and psychometrics applied. The end result was a measure of the quality of school life with a very acceptable degree of face and construct validity. Educators and students have enthusiastically accepted the content as addressing issues that matter to them. And, analyses of the various datasets that have been generated in this process have all come up with the same basic latent structure. But our priorities have been changed by circumstances and, basically, the work we initiated has lapsed.

So, naturally, I am delighted to see that Professors Roberts and Clifton have taken up the issue of measuring the quality of 'school life' in universities. The extension of the 'school life' model to 'university life,' and the coupling of the affective measure to a cognitive measure, seems to me a major contribution to the measurement of the internal efficiency of higher education institutions. The authors provide the means by which the traditional indicators of efficiency may be broadened to include measures of the affective and cognitive outcomes of higher education.

The development of the measures is theoretically informed and statistically sophisticated. I have no trouble at all in accepting that the quality of life model has a slightly different structure in university populations relative to that derived in teenage school populations. Relative to high school students, university students are a select group in terms of their intellectual capabilities and their educational achievements, and in terms of the aspects of their social origins and life experiences related to these attributes. While the data on the cognitive measure seems to betray its theoretical origins, it is early days yet — at least, I hope it is. As the authors point out, this was a new venture which achieved

partial success. In view of the importance of the cognitive measure, its strong theoretical foundations and the fact that it gains partial support in the data, I believe Roberts and Clifton should be encouraged to pursue the further development and refinement of this aspect of their project. Given this opportunity, I believe that, in a short time, Canadian universities will have at their disposal the means to measure the cognitive and affective outcomes of the institutional life and learning they provide.

Melbourne
Australia
April 1991

Trevor Williams
Associate Director
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PREFACE

Rau and Baker (1989, p. 161) begin their perceptive article on the condition of instruction in modern universities with this statement:

According to the Carnegie Council (1980), only 66 Western institutions found in 1530 are recognizable today. Of these, 62 are universities. Because they have lasted so long, is it not safe to assume that they, like the Catholic Church, will go on forever?

In Canada, universities are being challenged and it is clear that the status quo will not endure. Some post-secondary institutions have already been closed. In many instances, careful reviews are being conducted of existing programmes. In all cases, adjustments to decreased funding are underway, since real public expenditures for each university student have declined, in 1981 dollars, from \$12,247 in 1969 to \$9,724 in 1989 (Simpson, 1989). The adjustments to this decline in funding of over twenty percent include reducing staff, increasing class sizes, eliminating programmes, and not replacing outdated equipment (Campbell, 1989). Accelerated and more extensive organizational consequences are anticipated as the federal government reduces its contributions to Established Programmes Financing, which is the major source of post-secondary funding (Canadian Association of University Teachers, 1989). In short, Canadian universities are undergoing a period of reassessment and readjustment. They are being forced to rationalize their operations by paying stricter attention to what they are doing and how they are doing it.

Bulcock (1982) identified four areas in which sociological research contributes to reassessment and rationalization within educational institutions. Developing valid measures of "quality of school life" is one of these areas. Working from Bulcock's suggestion, this monograph describes our effort to construct an instrument for measuring the quality of student life in the university. Toward this end, the monograph contains six chapters. The first chapter reviews the historical development of quality of life (QOL) studies and highlights their importance as well as their strengths and weaknesses. After establishing the potential utility of developing a QOL instrument for university settings, the second chapter presents the theoretical rationale behind our research. Chapter 3 covers several methodological issues including the sample, instrument selection, and the procedures for the creation and selection of items. Chapters 4 and 5 specify how two theoretical dimensions of the quality of life of university students, the affective and cognitive domains, are measured, and reports the results of the empirical tests of these conceptualizations. The

monograph concludes with a chapter summarizing and discussing the scientific and practical merits of this research.

Readers should be aware that this is a technical monograph which reports on the development of an instrument for social scientific research. We have attempted to make the presentation as straightforward as possible, since we believe that educational researchers can learn from both the product of this work, the research instrument, as well as from the methodological procedures we have used. Nevertheless, a substantial portion of this monograph is devoted to presenting and discussing research techniques and findings, and readers should calibrate their expectations accordingly.

Finally, we wish to thank many researchers and colleagues who supported this work in one form or another. These include D. Bulback, J. Bulcock, J. Dean, S. Gregor, S. Halli, D. Jenkinson, J. Magnusson, S. Marshall, R. Perry, T. Piazza, J. Stapleton, J. Webster, and T. Williams.

Parts of Chapter 4 first appeared in a somewhat different form in the following source and are reprinted by permission of Kluwer Academic Publishers: "Measuring the Affective Quality of Life of University Students: The Validation of an Instrument." *Social Indicators Research* 25: 7-31, 1991. c. 1991 Kluwer Academic Publishers. Printed in The Netherlands.

CHAPTER 1

THE DEVELOPMENT AND RELEVANCE OF QUALITY OF LIFE STUDIES

The principal goal of this monograph is to present a theoretically and empirically informed model for measuring the quality of life of university students. As an initial step toward this goal, this chapter begins with a brief history of the quality of life research so that readers will have a context within which to understand the present investigation. Following this, we examine the meaning of "quality of life". In this respect, we ask: Why should we care about studying the quality of people's lives? After noting that the investigation of the quality of life has merit beyond that of satisfying the curiosity of researchers, we note the broad range of domains in which this type of research has been undertaken. In addition to being used to study a wide range of institutions and organizations, attempts have been made to study the quality of life in both primary and secondary schools. This research is reviewed. Finally, the chapter stresses the relevance of investigating the quality of student life in post-secondary educational institutions. Recognizing the unrealized potential of studying this dimension of university student life sets the stage for the remaining chapters in the monograph.

Quality of Life Research: An Historical Perspective

Schuessler and Fisher (1985, p. 130) note that "concern about the good life is probably as old as civilization." However, such a general concern needs to be distinguished from what may be called a "thoughtful concern". This distinction follows from the fact that most individuals are not equally reflective about all matters. The typical situation is that many people are not thoughtfully concerned about most aspects of their lives. In fact, most people, most of the time, seem to have a taken-for-granted orientation toward their experience, probably because they are too busy "experiencing" their lives to become engaged in serious reflection (Collins, 1989). This tendency to take one's experience as "given" rather than as problematic is so widespread that Peter Berger (1971) has labelled it "the imperative of triviality".

Granting the description of everyday experience as routinized, there certainly are occasions when people awake from their routines and question the meaning of their lives. In other words, there are circumstances when people become "thoughtfully concerned". Research suggests that such concern is likely to arise under conditions of rapid or extensive personal or social change, such as during rites of passage, political revolutions, or the collapse of economic systems. Our

taken-for-granted orientation and habitual coping mechanisms are most suitable when conditions are stable. In contrast, when our circumstances change, and especially when they change rapidly or dramatically, the effectiveness of our traditional ways of acting are seriously affected. We are then less able to achieve our objectives, and this frustration is expressed as surprise (Bredemeier and Bredemeier, 1978). Such surprise indicates that the situation is problematic and, consequently, we begin to think seriously about such matters as "what went wrong?" and "how does this system work?"

The historical development of quality of life research fits this general pattern about the conditions that encourage us to be "thoughtfully concerned". Using this perspective we would predict that thoughtful concern about the quality of life would emerge under social conditions of rapid social change. In fact this was the case in the United States during the 1960s, which is the historical period most observers use to identify when a serious concern with studying quality of life began.

Particularly in the United States, but in many other Western countries as well, a number of demographic and social variables interacted in the 1960s to create a social environment ripe for change. During this period, the bulge in the population pyramid, identified as the baby boom, were becoming young adults. As these young adults entered university it became apparent that they constituted a disproportionate share of the population and, accordingly, could exercise considerable power in the political and cultural systems. The potential of this demographic force to affect change was cultivated by a buoyant economic system. In short, in many Western countries it was during the 1960s that the economy was booming and a general ethos of optimism prevailed. Of course the situation was considerably more complicated than this brief sketch suggests, but the interaction of a large youthful sub-culture and an active economy generally promoted a liberal social climate. As a number of public opinion polls illustrated, there was considerable support for the idea that substantial social changes, and perhaps even radical reforms, were possible.

It was at this time that President Johnson introduced his Great Society programmes which, in many respects, marked the beginning of the concern about quality of life. Campbell (1981, p. 4) reports President Johnson on this account:

The task of the Great Society is to ensure our people the environment, the capacities, and the social structures which will give them a meaningful chance to pursue their individual happiness. Thus the Great Society is concerned not with how much, but with how good – not with the quantity of goods, but with the quality of our lives.

3 Measuring the Quality of Life of University Students

From its inception in the early 1960s, the efforts to improve the quality of life and achieve a Great Society expanded in a number of institutional sectors including, for example, education and manpower, community development and housing, and health and welfare. The seriousness of the attempt to improve the quality of life is illustrated by the fact that, even though tens of billions of dollars were devoted to programmes in these social development areas in 1965 in the United States, in "real terms, spending in 1972 was between four and five times what it had been in 1965" (Ginzberg and Solow, 1974, p. 111). In short, the Great Society programmes to improve the quality of life were taken very seriously in terms of both public policies and public spending.

These programmes presented more than substantial political challenges; they also posed serious intellectual challenges. With so many resources being devoted to potential improvements in the quality of life, it became imperative to ask whether such potential improvements were being realized. The task of developing measures of the quality of life in various social domains was given to social scientists. In brief, this marked the beginning of "thoughtful concern" directed toward developing reliable and valid techniques for measuring the quality of life.

Conceptualizing Quality of Life

The investigation of any topic requires an understanding of what people have in mind when they use specific concepts. Such conceptual clarification is especially necessary for terms used in the social sciences, many of which have ambiguous connotations (Lachenmeyer, 1971). This is true for the concept of "quality of life". As Andrews (1986, p. ix) notes, "The terms used to invoke notions of life quality differ, depending on one's profession...[the] terms are not comparable...and nobody has yet succeeded in dividing up the conceptual territory in an elegant, uncontested way." Since one of the goals of this monograph is to present a theoretically and empirically persuasive means for measuring the quality of life of university students, it is important to examine how this concept is used by social researchers.

A primary distinction in the quality of life literature is between "quality" and "quantity" of life. As the historical review suggests, the intention of this distinction is to shift attention from a concern with the amount of various outcomes (e.g. the number of students per teacher) and focus more on the degree or kind of experience (e.g. the satisfaction students experience with the learning process). In Schuessler and Fisher's (1985, p. 131) words, "... quality has the same meaning as grade and ... grade ranges from high to low, from better to worse." The salient point is that isomorphism does not necessarily exist between

the objective circumstances of people, as expressed in terms of quantities of objects in their environment, and their subjective experiences. As long as such misalignment exists, there is a need to independently investigate the quality of peoples' experience, rather than attempt to infer quality from indicators of environmental quantity. This is the distinction that Campbell, Converse, and Rogers (1976, p. 1) were underlining when they pointed out that quality of life refers to "a sense of achievement in one's work, an appreciation of beauty in nature and the arts, a feeling of identification with one's community, a sense of fulfillment of one's potential."

An analogy exists between the quantitative/qualitative distinction and the differential appreciation of an object's manifest and latent properties. Manifest properties are the superficial appearance of an object, while the latent properties are hidden and require more penetrating exploration. Similarly, manifest content can typically be measured in a rigorously quantitative manner, while latent content is often better indicated by qualitative means. For this reason, "quality" is related to the notion of "grade". Importantly, the fact that quality of life measures are concerned with properties that are less amenable to precise quantification does not diminish their importance. In fact, recent scholarship by well-known quantitative researchers is seriously questioning the limits of the quantitative paradigm (Duncan, 1984; Lieberman, 1985). Moreover, recent research also indicates that people are increasingly concerned about the quality of their experiences and, often, are willing to exchange considerable amounts of quantity for more quality. Without debating the relative merits of quantitative and qualitative approaches, two points are clear. First, quantity and quality refer to different dimensions of experience which, therefore, must be measured in different ways. Second, contrasting quality with quantity provides conceptual clarification, but does not imply that these two are unrelated empirically. Obviously, without some amount of quantity, quality is a meaningless concept.

In general, the quality of life literature uses the concept "quality" to refer to the degrees of satisfaction or sense of well-being people experience in a specific environment. Related terms include the notions of life fulfillment, social welfare, and contentment. The degree to which the environment is specified clarifies the referent of the term "life". For some research the focus is on a person's entire experience, in which case the term "life" is meant to be taken literally. In this type of research the focus is on "global satisfaction". In contrast, other research focuses on the quality of people's experience in specific institutional contexts, such as schools, among hospitalized elderly persons, or in urban settings. Research of this type measures "domain-specific satisfaction".

The present research trend is toward developing and utilizing domain specific quality of life measures. The argument is that social programmes are

more likely to be efficient and effective when they are targeted at achieving specific objectives. Domain-specific quality of life instruments are better than global instruments at documenting whether the goals of particular institutions are being achieved and, therefore, have "greater relevance for public policy" (Schuessler and Fisher, 1985, p. 131).

Domain-specific quality of life instruments focus on subjective well-being within a specific institutional context. Such well-being is interpreted as resulting from the interaction of the character of people, called their "subjective-value context", and the nature of the environmental, cultural, and social structures to which they are adapting. This distinction is captured in Gerson's (1976, p. 794) point that quality of life is "the degree to which an individual succeeds in accomplishing his desires despite the constraints placed upon him by a hostile or indifferent nature, God, or social order."

The Relevance of Quality of Life

Generally, two basic answers exist to the question "Why bother to know something?" From these answers two basic types of social research have evolved. One reason for knowing something stems from the fact that humans are innately curious. Social scientists call this the "exploratory drive" or "intrinsic motivation". Whatever the name, the point is clear: many people enjoy learning new things simply for the sake of knowing them. There is pleasure in moving from ignorance to knowledge, from uncertainty to certainty and, in this sense, learning is "fun". From this reason flows the idea of "pure" or "basic" research which includes investigations that are conducted toward expanding the frontiers of a discipline and working toward a more complete mental map. The second reason for knowing something is that it increases our chances of survival. In other words, people with more knowledge are better able to act in ways that are likely to improve their lives. From this utilitarian reason flows the idea of "applied" or "policy" research.

Each of these types of research has its own functions and justifications. Nevertheless, it seems fair to observe that in the social sciences there is an increasing concern about justifying research in terms of its practical applications. As Lenski (1988, p. 164) notes, "without such a commitment it is difficult to justify public support". The lesson here is clear: investigating the quality of life of university students may be justified by more than the abstract interests of academic researchers. Practical applications of such research can also be identified.

The relevance of quality of life research for social policies begins by noting that such studies are typically undertaken in situations where some public or private service is being either considered or offered. Agencies such as those

promoting community development, housing, health, or schooling are, in fact, providing services that some public is paying for, either directly or indirectly. These services may be interpreted as attempts to increase the domain-specific quality of life for the consumers or clients. In other words, hospitals, schools, community clubs, welfare agencies, and churches are all in the business of increasing the quality of peoples' lives in ways that empower them to gain a "sense of the fulfillment of [their] potential" (Campbell et al., 1976, p. 1).

This humanistic interpretation of the function of social institutions also has important practical implications. As sociologists remind us, all forms of social organization should be thought of as means for achieving certain goals and not as the goals themselves. That is, social systems are intended to assist people in coordinating their conduct so that they can derive greater benefits than they could through their individual efforts. Improving their quality of life is one such benefit. On this account, Beck (1990) argues that the quality of student life, as indicated by students' well-being or happiness, should be a principal yardstick for measuring the worth of educational institutions. Too frequently, however, organizations are construed as ends rather than means for achieving greater human happiness. When this occurs, individuals are judged in terms of how well they serve the needs of the social organization. This results in people feeling that they are dehumanized; they get the impression that the organization is not concerned with their needs but with fulfilling a bureaucratic mandate. Quality of life studies counteract this undesirable tendency to place the organizational interests above the interests of individuals; they accomplish this by focusing attention on humane considerations. That is, this research focuses upon how people feel when they interact within the constraints imposed by an institution. As Epstein and McPartland (1976, p. 15) note, the tendency to stress organizational over individual interests is one of the principal reasons why the quality of school life has been under-researched. That is, schools have been preoccupied with measuring their "success" in terms of quantitative outcome measures, such as performance scores, rather than in terms of considerations about social process, such as the quality of life of the students and teachers.

Paying attention to the quality of life has practical implications for not only improving the experience of individuals, but also for improving organizations. From the viewpoint of organizations, the perception of existing structures as means rather than ends indicates that ritualism is occurring. Ritualism means that employees are neglecting the larger organizational purpose of serving the public and, instead, are concentrating on administrative details. With the onset of ritualism, organizations become remote from the interests of their clientele, who experience such organizations as alienating (Berger and Neuhaus, 1977).

In turn, the public reputation of the organization often declines and its services erode. By attending to the quality of peoples' encounters with the organization, administrators can monitor the extent of organizational ritualism and implement remedial procedures to ensure, to some extent, the accountability and the flexibility which is associated with long term success.

These observations reinforce our earlier remarks on the historical development of the research on the quality of life. As we noted, this research was initiated during the 1960s as social scientists became dissatisfied with the existing quantitative indicators of the benefits of social welfare policies. Their dissatisfaction was with the existing emphasis on quantitative indicators of the effectiveness of the programmes (such as the number of clients served) to the neglect of considering the quality of the experiences individuals had with the organization (i.e. whether it served their needs). In essence, quality of life research is practical because it helps "humanize" the encounters individuals have with organizations. Instead of focusing upon objective outputs of organizations, the focus is on the satisfaction of those individuals who are served by organizations.

Studying Quality of Life in Schools

Over the past quarter century recognition of the relevance of research on the quality of life has occurred in a number of institutional spheres. This is a tribute to the growing appreciation that attention to the quality of the encounters individuals have with organizations helps serve the interests of both. A sense of the rapid expansion of quality of life research can be found in reviews by Palys and Little (1980) for psychology, Larson (1978) for gerontology, and Michalos (1986) for job and marital satisfaction. Michalos (1986, p. 59) reviewed the content of thousands of recently published quality of life studies and reports that the topics investigated were distributed as follows: job satisfaction, 48%; life as a whole, 16%; marriage, 11%; old age, 7%; housing and neighborhood, 5%; health and human services, 4%; politics and social relations, 4%; family, 2%; crime and justice, 2%; education, 1%. This distribution indicates that although quality of life research is a well-established and legitimate concern for social investigation, it is a topic infrequently applied to educational institutions. Our goal is to contribute to the application of the quality of life concept within the educational system. The following review provides a sense of the kinds of quality of life studies done in educational research to date, and supplies the context for the present study.

The bulk of the quality of life research in educational settings is found in the literature on the "character" of schools. Silberman (1970, p. 3), for example, provides one illustration of this orientation:

It is not possible to spend any prolonged period visiting public school classrooms without being appalled by the mutilation visible everywhere — mutilation of spontaneity, of joy of learning, of pleasure in creating, of sense of self... Because adults take the schools so much for granted, they fail to appreciate what grim, joyless places most...schools are.

To be sure, more balanced (Jencks, et al., 1972; Kelly, 1980), even optimistic (Bredemeier, 1976), assessments of school character exist, but they all centre on the point that the quality of school life is an important variable. As Kottkamp, Mulhern and Hoy (1987, p. 31) note, "Recent attention to school effectiveness and organizational cultures has reemphasized the importance of the climate of the school." This conclusion is echoed by Epstein (1981, p. 1) who notes: "Although schools define many goals, academic success is the only goal regularly monitored. This restricted emphasis has been seriously challenged for over two decades... [Numerous researchers] recognize that other outcomes are important for student development and for determining how schools are doing."

The argument for the relevance of studying the quality of school life begins with the appreciation that variables other than the cognitive attributes and strengths of students affect their academic performances (Kottkamp, et al., 1987). In Williams and Batten's (1981, p. 1) words: "The main thrust of this argument is that students who are happier, more enthusiastic, more engaged in life within schools are, ceteris paribus, likely to learn more and perform better on achievement tests." In searching for independent variables that facilitate such productive orientations in students, a body of research developed with the goal of assessing the satisfaction of teachers. The idea was that satisfied teachers are an important contributor to "school climate" which, in turn, affects student achievement. Studies by Halpin and Croft (1963), Halpin (1966), Stern (1970), and Moos (1978) illustrate this research tradition.

One significant limitation of this research is that it concentrates on the correlates and potential causes of student satisfaction rather than on measuring the quality of student life directly. As Kottkamp, et al. (1987, p. 35) note "a concept of school climate that ignores students ...[is] like discussing politics without voters." Taking this criticism to heart, a complementary research trend has recently taken on the task of examining the quality of student experiences from their point of view. Using self-report data, student attitudes and orientations on a number of school related topics (such as classrooms, teachers, and curriculum) have been conducted (see Jackson, 1968; Silberman, 1971). Moreover, besides these investigations on particular topics, assessments of

more global experiences with school have also been undertaken (see Husen, 1967, p. 121; Epstein and McPartland, 1976).

The relevance of measuring the quality of students' experience is justified by more than the argument that quality of experience is related to academic achievement. Even without evidence of the relationship between these two factors, an independent concern with the quality of student life is justifiable. On this account, we agree with Fraser (1986, p. 1) who states that "having constructive classroom environments is an intrinsically valuable goal of schooling." Public education is primarily a social process that has enormous effects upon the lives of children and young adults. Jackson (1968), for instance, estimates that children spend approximately 7,000 hours in school by the time they complete their elementary education, and Rutter, et al. (1979) estimate high school graduates have spent approximately 15,000 hours in school. Schools, possessing the right and capabilities for such extensive control over the lives of young people, must exercise their authority in a humane manner. After all, as Bredemeier and Bredemeier (1978) note, schools are organizations where the self-respect of students is at considerable risk, and neglecting the quality of student experience "can result in the destruction of the human qualities that make schooling a worthwhile experience for those engaged in it" (Reid, 1986, p. 1). Thus, studying the quality of student life can be justified by both its relationship to academic achievement as well as on the basis that it is an intrinsically valuable area of research.

Following this rationale, a number of sophisticated research studies have recently attempted to conceptualize and empirically identify the quality of the lives of students in elementary and secondary schools. Fraser (1986, pp. 14-71) provides a review of four instruments intended to measure the quality of classroom environments. These include scales called the Learning Environment Inventory, the Classroom Environment Scale, the Individualized Classroom Environment Questionnaire, and My Class Inventory.

The Learning Environment Inventory is an improved version of the Classroom Climate Questionnaire developed by Walberg (1968). This instrument is intended for use in secondary schools and contains fifteen dimensions, each measured by seven indicators. The indicators take the form of statements to which respondents give Likert-type responses, ranging from strongly agree to strongly disagree. The dimensions of the learning environment measured in this instrument include: cohesiveness, friction, favoritism, cliqueness, satisfaction, apathy, speed, difficulty, competitiveness, diversity, formality, material environment, goal direction, disorganization, and democracy. The Classroom Environment Scale was designed to measure the environment in

secondary schools. This scale is one of a set of social climate scales developed at Stanford University and contains 90 items measuring nine dimensions. The dimensions represented are: involvement, affiliation, teacher support, task orientation, competition, order and organization, rule clarity, teacher control, and innovation. The Individualized Classroom Environment Questionnaire is an instrument for use in "open" classrooms or those that are based on individualized learning programmes. This scale has fifty items measuring five dimensions including personalization, participation, independence, investigation, and differentiation. Like the previous two instruments, the Individualized Classroom Environment Questionnaire is for secondary school students. By contrast, the My Classroom Inventory Scale is intended for primary schools, and is a revised version of the Learning Environment Inventory. It has been simplified to include only five dimensions (cohesiveness, friction, satisfaction, difficulty, and competitiveness) and requires a significantly lower level of reading ability.

As Anderson's (1982) review article indicates, these four scales are just a few of the roster of existing instruments intended to measure various dimensions of school environments in elementary and secondary schools. As such, they illustrate that even though little research has been conducted examining the quality of life in educational institutions compared with other institutions, there is still an active interest in examining the quality of student life at the elementary and secondary levels. Nonetheless, the same cannot be said for examining the quality of student life in post-secondary institutions.

Studying the Quality of Life in Universities

Barry Fraser reviewed the classroom environment and quality of school life literature and notes that "Despite strong traditions of classroom environment research at the primary and secondary school levels, surprisingly little analogous work has been conducted at the higher education level" (Fraser, 1986, p. 29). In a partial remedy to this situation, Fraser and his colleagues have developed an instrument, the College and University Classroom Environment Inventory, to assess the quality of life of post-secondary students. This instrument uses seven indicators to measure the dimensions of personalization, involvement, student cohesiveness, satisfaction, task orientation, innovation, and individualization. The principal deficiencies of this instrument are that it "is not suitable for use in lectures or laboratory classes" and that it "is intended for use in small groups" (Fraser, 1986, pp. 29-30). Other instruments which have been developed to measure the quality of life in post-secondary institutions, including Pace's (1969) College and University Environment Scales, and Peterson et al.'s (1970) Institutional Functioning Inventory, have similar limitations.

The shortage of instruments for measuring the quality of life in post-secondary institutions is a serious deficiency for two reasons. First, universities

and other post-secondary institutions are expensive public institutions that are increasingly likely to be held accountable for their performances. Although these institutions have complex functions, one of the most important is teaching students. In this respect it seems appropriate that the quality of post-secondary student life be assessed to ensure that these institutions are responsive to the educational needs of the students, and not simply to the bureaucratic requirements of the institution or the demands of professors. Students are an integral part of these institutions and their experience needs to be assessed if meaningful and effective adjustments are to be made. For example, if very able students are dissatisfied with their experience and drop out, the post-secondary institution and the society both lose. Moreover, if dissatisfied students stay in the organization, the risk exists that they may divert their energy from academic achievement toward subverting the institution (see Wright and Jesness, 1981). This argument is reinforced by the point Epstein (1981, p. 1) makes: "The number of resources and facilities tell little about the lateral processes of the school, the distribution of available resources among students, the growth or change of student achievement, or the student's evaluations of how it feels to be part of the school or classes. Many studies...have pointed out that the quality of school life for students and teachers is more likely to be determined by the social processes in schools and classrooms than by objective quantities of things."

Second, there is a political reason for attending to the quality of experiences university students have. This point is based on the facts that universities and other post-secondary institutions acquire most of their funding from governments and that most members of the public have little direct contact or experience with these institutions. These facts place most post-secondary institutions in a vulnerable public relations position. This vulnerability stems from the fact they are places where governments can reduce expenditures with minimum risk. Although the proportion of the public who have direct contact with universities is relatively small, these institutions can reduce their political vulnerability by obtaining support from a larger public. Probably most people develop their impressions of universities from the reports they receive from family members and friends who are attending these institutions. For every person who actually attends a university and forms a first-hand impression about the quality of his or her experience, there are likely several others who have similar opinions because of what they have heard. In other words, students who attend universities are opinion leaders with respect to the impressions the general public forms of these institutions. Their opinions have multiplier effects. It follows that one way universities can raise the consciousness and

sympathy of the general public is to pay more attention to the quality of their students' lives in the institutions. Such attention might go some way toward heading off what Sykes calls the "shock troops", who constitute a "national association or union of parents and students that will serve as a counterweight to the institutional power of the professors" (Sykes, 1988, p. 263).

In order to have meaningful measures of the quality of life of university students, they must be constructed in accordance with the principles of social science research. Selective perceptions or impressions of administrators or professors about the quality of student life are inadequate. Neither is it adequate to attempt to infer the quality of student life from quantitative indices such as the size of libraries and student-professor ratios. Finding a direct means for measuring the quality of student experience in post-secondary institutions in a scientific manner is essential. Only through such conceptualization and research can responsible authorities gain an accurate understanding of the experiences their consumers, the students, are having and of the messages they are giving to the general public. Moreover, only from this type of monitoring can appropriate remedial programmes be developed and implemented.

Summary

Quality of life indicates the subjective sense of well-being someone experiences in either a general or a specific social context. We have argued that recent social changes fostered the development of a scientific approach to the measurement of the quality of life. The political promises of the vision of the Great Society in the 1960s were antecedents to the systematic study of quality of life during the last two decades. Scientific research on the quality of life has expanded largely because organizations have become aware of the need to be accountable to various publics. In order to optimize the utility of quality of life studies, research has focused on measuring this property in specific institutional sectors, such as health care, housing, and education. For education, several quality of life instruments exist for elementary and secondary schools, while few attempts have been made to develop quality of life instruments for post-secondary institutions. This lack of application to university settings represents an unfortunate deficiency. The programmes and politics of post-secondary institutions could be improved by measuring the quality of student life, and using this information to develop systematic improvements to these organizations.

The goal of this monograph is to present a means for measuring the quality of student life in universities. With this background, meaning, and relevance of the project in place, we turn our attention to providing the theoretical framework which guides our exploration of the quality of life as it applies to university students.

CHAPTER 2

CONCEPTUALIZING THE QUALITY OF UNIVERSITY STUDENT LIFE

It is one thing to argue for using instruments that indicate the quality of life of university students, and it is another to construct instruments to measure these experiences. Any well developed measuring instrument must be supported by a conceptual framework. Without such theoretical linkages, the findings will be either meaningless or subject to competing interpretations. This chapter presents the theoretical justification for our measurement of the quality of university student life. Our argument is that the experiences of university students can be characterized in terms of two domains, the cognitive domain and the affective domain. The chapter describes each of these domains in terms of the models presented by Bloom et al. (1956), for the cognitive domain, and Williams and Batten (1981), for the affective domain. The intention is to provide a meaningful way of conceptualizing the experience of university students in a manner that facilitates empirical measurement.

Domains of the Quality of University Student Life

Research on the quality of life may be viewed as a form of evaluation research. Conceptualized in this way, the problem for such research becomes that of identifying the desired outcomes of the institution or organization under consideration. In this regard, the experience of university students is complicated because students attend these organizations for many reasons. The picture becomes clearer, however, if we examine the issue from the perspective of the institution. Clearly educational institutions cannot, and should not, attempt to provide for all the varied interests of their students. The agenda of the university is much more restricted than the agenda of the students. Thus, in assessing the quality of student life, it is reasonable to focus on the domains that the institution is attempting to promote.

We argue that the university is attempting to optimize the quality of student experience in two domains, the cognitive domain and the affective domain. In other words, universities are designed to stimulate and challenge the students' intellects while supporting and enhancing the students' feelings of self-worth and dignity. The rationale for focusing on these domains is related to the principles of socialization, which is the process where representatives of an organization attempt to change the characteristics of individuals. It is well established that changing individuals typically requires overcoming considerable resistance (Bredemeier & Bredemeier, 1978, pp. 168-174). Given

this fact, the question for teachers at all levels becomes: What conditions facilitate the chances of overcoming resistance and changing the characteristics of learners?

The social psychological literature suggests that power and affect are two salient dimensions that must be regulated if significant changes in individuals are to occur (Brim, 1966; Boldt, Lindquist, & Percival, 1976; Coser, 1979, Roberts & Clifton, 1988). The central thrust of this literature is that successful teaching, at all levels, requires both the imposition of clear social expectations or demands for change, which constitutes the power dimension, and sustained social support, which constitutes the affective dimension. In utilizing both of these qualities teachers become, in Kleinfeld's (1975) terms, "warm demanders". The task is to demand a limited, specific set of changes from individuals while, at the same time, providing support for the preservation of their personal integrity and dignity.

Research by Brookover et al. (1975, 1978, 1979) illustrates that social characteristics of classrooms, like the distribution of power and affect, influence the academic performance of students. These researchers focused on students from families of lower socioeconomic statuses who were thought to be permanently handicapped by their home environments. Specifically, the research compared schools in low socioeconomic status areas where student achievement scores were increasing, with schools where student achievement scores were decreasing. They pointed out that variations in both power and affect were important to the differential success of students in these schools. Classrooms where students were typically high achievers contained teachers who set rigorous academic standards and clearly communicated their expectation that students strive to achieve these expectations. In terms of this power dimension, teachers of achievement oriented students were cognitively demanding. In addition, these teachers combined their high expectations with a supportive emotional climate in which they displayed genuine empathy for their students. In short, teachers of high academic achievers were affectively warm and caring. The contribution of this combination of teacher attributes, personal warmth and cognitive demandingness, to students' academic success is also found in the work of British researchers (Rutter, et al., 1979).

The balance between the power and affect domains in the classroom appears critical to optimising the academic achievement of students. If power is stressed over affect, the result is likely to be the short term compliance of the students. Social psychologists call this "behavioral conformity" because the changes are superficial. Under these conditions, students are threatened by the challenges, and they cope by conforming to a minimal degree. By overemphasizing the

power domain, a teacher risks demanding too much from students, with the result that students will likely attempt to avoid both the teacher and the activity. At the other extreme, effective learning does not take place when too little is demanded of students, which is the situation when the affective domain is overemphasized. In this case, students are supported for maintaining their existing self, since there are few demands for change. As a result, the status quo is reinforced and meaningful change is unlikely to occur.

When power and affect interact in a controlled manner, genuine and enduring change is more likely to result. As Dunkin and Biddle (1974) note in their review of the literature on classroom climate "at least two dimensions, warmth and directiveness, are necessary to describe the teacher's efforts to influence classroom events" (quoted in Moos & David, 1981, p. 60). Following this reasoning, the mission of universities can be characterized in terms of their manipulation of power and affect in order to change the characteristics of students. This conceptualization underlies our attempt to measure the quality of life among university students. It deserves noting that the distinction between the cognitive and affective domains of university student experience is consistent with that used in the quality of life literature. As Abbey and Andrews (1986, pp. 90-91) note, "In this usage, 'affect' refers to an emotional, 'from the gut' reaction, and 'cognitive' refers to an intellectual, 'from the head' evaluation. These components tie closely to what are believed to be fundamental components of all attitudes". Similarly, Gump (1980) identifies two major components of the social context of schools as "the formal, or program, aspect — stabilized 'ways of doing' that spell out how individuals can integrate their actions to carry out the tasks or operations of the setting...[and] the human relations, or informal social interactions, aspect — what Robert Propst (1972) called the 'environment of feeling' (quoted in Moos & David, 1981, p. 59). These components are essentially similar to the cognitive and affective domains we are using (see also Isherwood & Ahola 1981, p. 174).

In this respect, the major responsibility of universities is to expand the cognitive domain of the students, which involves challenging the existing state of their cognitive development. Setting demanding cognitive standards relates directly to the dimension of power discussed earlier. Indeed, it is the duty of professors to impose high cognitive standards on their students. At the same time, if professors wish their students to internalize the ideas being presented rather than merely complying with their cognitive demands then these demands must be supported by positive sentiments or positive affect. In our conceptualization, the ideal learning experience for university

students is one in which challenging cognitive demands take place in a supportive environment. This is the optimal learning situation because it allows students to focus their intellectual resources on the cognitive challenges, while not being distracted by other frustrating events, such as challenges to their self-image and self-worth.

Most university students are prepared to learn. However, their status as students should not obscure the fact that they are people who have a variety of needs to be satisfied, including existing self-concepts and esteem they wish to maintain. This human character makes students vulnerable, and this vulnerability must be considered by university professors and administrators. If attention is not given to this vulnerability then, when challenges occur, students are likely to divert their resources away from the cognitive demands and the concurrent cognitive development, toward retaining their self-integrity. Thus, it makes sense that university professors must direct their efforts at managing both the power and the affective domains which have been identified in the socialization literature. With this general background in place, we can now elaborate on the specific conceptualizations of the cognitive and affective domains used in this study.

The Cognitive Domain

As previously noted, the primary objective of universities is to develop the intellectual abilities of their students. Whatever other functions the university may serve, this is its most important objective. Given this, our first task was to determine whether or not this objective was being achieved from the students' perspective. In approaching this task a conceptualization of the various types of cognitive learning had to be used. For this study, the conceptualization developed by Bloom, Engelhart, Furst, Hill, and Krathwohl (1956) was selected.

The model, presented by Bloom et al. (1956) in the Taxonomy of Educational Objectives. Handbook I: Cognitive Domain, provides a theoretically informed way of thinking about the cognitive development of students. The dimensions of this model can be translated into instructional objectives and criteria for evaluating these objectives. The model is hierarchical in that it assumes that lower order cognitive stages are necessary for higher order stages. In other words, successful performance at higher cognitive levels is dependent upon mastery of the lower levels. For present purposes, this model is useful for three reasons. First, it provides a way of conceptualizing cognitive development that can be translated into instructional objectives. In this way, Bloom et al.'s model is functional for organizing professors' thinking about what they are attempting to achieve. Second, given this systematization, the

objectives can be used as criteria for evaluating teaching and learning. Finally, since these objectives were developed from the perspective of the students, rather than from the perspective of professors and administrators, they may be adapted to measure the cognitive quality of life experienced by students. In short, these objectives are relevant to measuring the subjective experiences of students in the cognitive domain.

The Taxonomy of Educational Objectives presents six, hierarchically ordered objectives: knowledge, comprehension, application, analysis, synthesis, and evaluation. The meaning of each of these educational objectives is described below:

1. Knowledge. This is the lowest level of cognitive mastery and represents the most fundamental educational objective. It refers to the ability of students to remember and recite the facts of the discipline they are studying. The achievement of this objective is fundamental to mastering the higher objectives, and involves the demonstration that the information being transmitted has been received and understood by the student in a relatively complete and correct manner.

2. Comprehension. It is one thing for students to be able to accurately recite the material that has been transmitted to them, and it is another thing for them to make this material "their own", which involves comprehending it. The task of comprehension requires that students take the information provided to them and be capable of restating the essential content in their own words. Being able to do this indicates one way in which students will have made the material "their own", since it involves the translation and interpretation of the information. Comprehension involves understanding the material by relating it to information based on prior learning and, in this manner, the students are able to place the new information within the context of their existing intellectual frameworks.

3. Application. Having mastered the ability to take material and restate the content in more familiar terms, the next stage of cognitive development involves the ability to take the material and apply it to new situations. The ability to transfer the understanding of some content to new situations, and see how the concepts and principles operate, is the essence of application.

4. Analysis. Thus far, the cognitive objectives have been concerned with the mastery and application of discrete pieces of information. In other words, specific, isolated facts, concepts, and principles are presented and recited (knowledge), translated into terms the students are familiar with (comprehension), and utilized in new situations (application). These capabilities are very important for many purposes, but in life, specific facts, concepts, and principles often occur within a context of other ideas and evidence, comprising a

complicated network of information. The objective of analysis acknowledges this complexity. Analysis refers to decomposing ideas into their constituent components and making the relationships among the parts explicit. Students possessing this ability will be capable of viewing the information in systemic terms, where a system is defined as a set of variables and relationships between variables. When confronted with a system, students with analytical abilities are able to identify both the operating variables and the connections through which the variables affect one another.

5. **Synthesis.** Beyond the ability to dissect complicated interrelationships into their constituent components is the ability to synthesize information. Whereas analysis requires the decomposition of information, synthesis requires composition. Specifically, synthesis involves the ability to put facts, concepts, and principles together to form new interpretations, practices, and perspectives. Synthesis involves students in the act of creation through which ideas are integrated.

6. **Evaluation.** The final cognitive objective is evaluation, which involves the ability to judge the value of material for specific purposes. In evaluation, students assess, weigh, and appraise the new perspectives that have been created through synthesis in terms of how the parts or whole contribute to some specific purpose. This assessment often involves using the criteria of internal consistency and external validity.

These six objectives are the basis for our conceptualization of the cognitive domain. The instrument we have developed and the procedures we have used to measure these objectives are reported in Chapter 4. Readers interested in a more detailed conceptual appreciation of this domain are encouraged to consult the original work by Bloom et al. (1956), or any of the extensive summaries that appear in the educational literature.

The Affective Domain

The cognitive domain is intended to tap the quality of life in terms of how the institution affects the minds of students. In contrast, the affective domain is intended to capture a sense of how students feel about their experience in the institution. Although research extending over three decades exists for conceptualizing and measuring the cognitive domain of the quality of student life, this is not true for the affective domain. Serious attempts to conceptualize and measure this domain began relatively recently with conceptualization and research by sociologists, such as Spady and Mitchell (1979) and Williams and Batten (1981). Our conceptualization builds upon their work.

In the affective domain, an important distinction is made between global and specific measures. Global measures include general feelings related to students'

experiences in universities. Our investigation includes two global measures, positive affect and negative affect. In addition to these two global components we use several indicators of specific dimensions relevant to experiences of students in educational institutions. These specific components are taken from Williams and Batten (1981), who initially employed the theoretical work of Spady and Mitchell (1979), and refined them on the basis of a series of empirical tests. The result is a model that specifies four specific dimensions intended to indicate concepts relevant to the quality of student life and theoretically tied to functions of educational institutions. These dimensions are identified as status, identity, professors, and opportunity.

The justification for including both specific and global measures of the quality of life is provided by Campbell et al. (1976, p. 61): "The utility of global assessments is somewhat limited, unless they are fleshed out with more detailed information about reactions to more specific domains of life...we might expect that whatever global report an individual gives to his overall sense of well-being should be some compound of his gratifications and disappointments with more specific features of life..." Following this rationale, the conceptualization problem becomes one of specifying a set of dimensions that are both relevant to the purposes of education and linked to the quality of life the students have in universities. For our purposes we identified the set of global and specific measures described below.

1. **Positive Affect.** This global dimension of the affective domain refers to students' feelings about their experience in universities as a whole. On this account, students report on their overall assessment of how positive their educational experiences have been in terms of such things as general enjoyment, feeling positive, happiness, and liking their institution.

2. **Negative Affect.** This global dimension is the opposite of positive affect, and refers to the intensity and frequency with which students experience being upset, depressed, lonely, alienated, and restless. Along with positive affect, this dimension provides an assessment of the general feelings students have about their experiences in universities.

3. **Status.** Educational institutions are expected to "nurture and guide each student's sense of social responsibility for the consequences of his/her personal actions, and for the character and quality of the groups to which the student belongs" (Spady and Mitchell, 1979, p. 9). In fact, universities have developed structures in order to meet this obligation. The specific organizational response to the development of social responsibility in students has been "supervision structures, which engender the development of social responsibility in students through adjustment to and learning of prevailing norms and values" (Williams

& Batten, 1981, p. 9). In other words, educational institutions establish a set of social statuses. To be part of the institution, students who occupy these statuses are expected to constrain their conduct so that it is aligned with the norms and values of the organization. In aligning their actions with the social structure, students are sacrificing some of their autonomy in order to serve the collectivity. To the extent that the institution can induce students to fulfill the obligations of their statuses, they will experience feelings of social worth. In other words, feelings of "status" are derived from interaction with other students in the university. To the extent that others look up to, think a lot of, have confidence in, and seek the assistance of a student, the student will feel important and will experience feelings of well-being in this domain.

4. Identity. Educational institutions are also expected to "generate and support social integration among individuals across cultural groups and within institutions" (Spady & Mitchell, 1979, p. 9). To meet this obligation, universities develop "socialization structures, which emphasize student participation in the social system" (Williams & Batten, 1981, p. 9). Through these structures, students develop an awareness of their relationship to the social structures. The realization by students of their place in the social system serves both collective and individual interests. For the social system, socialization processes help constrain and coordinate the conduct of individuals and, by doing so, contributes to social integration. This process contributes to identity formation of the individuals by providing them with reference points for establishing, understanding, and accepting themselves with respect to others. The cultivation of self-awareness in relation to others helps students recognize their interdependence, and contributes to their integration into the university. For individuals, the clarification of their self-integrity and worth contributes to their feelings of identity and adds to their quality of life.

5. Opportunity. This component of the affective domain of the quality of life is also related to an obligation of the institution. Spady and Mitchell (1977, p. 9) describe this obligation as a requirement to "facilitate and certify the achievement of technical competence, in effect, to certify that individuals are capable of doing tasks valued in the society at large". In order to establish technical competence, universities provide certification structures "which enable students who have reached agreed standards of technical competence to qualify for certificates, rewards, promotions and the like" (Williams & Batten, 1981, p. 9). The certification processes of universities can either contribute to or detract from the quality of life of students. The students' assessment of their experience in the certification process is related to their perception of relevance of the process they are undergoing. The relevance of the standards students are

expected to meet is associated with how clearly the certification standards appear to be related to opportunities the students have for achievement. To the extent that universities are organized so that students feel they can take advantage of relevant opportunities, then they will probably feel that the institution is developing their competence. Such feelings of competence are what the opportunity dimension of this instrument is attempting to capture.

6. Professors. In Williams and Batten's research, the first five dimensions of the affective domain were deduced and empirically confirmed from the sociology of education literature. The final dimension, which they called teachers and we call professors, was developed inductively. That is, this dimension was not initially posited by Williams and Batten as based upon theory, but resulted from their empirical analyses. This dimension focuses on the quality of professor-student interaction both inside and outside of the classroom. Since the interaction students have with professors represents a considerable amount of time and resources for both parties, it is not surprising that the nature of this interaction, and the students feeling about it, contributes to their quality of life. The sociological literature suggests that a salient aspect of this interaction is the perceived equity of the interaction. That is, students experience a higher quality of life if they perceive that their professors are fair and just, which is what this dimension indicates.

These six objectives are the basis for our conceptualization of the affective domain. The instrument we have developed and the procedures we have used to measure these objectives are reported in Chapter 5. Readers interested in a more detailed appreciation of this domain are encouraged to read the original work by Spady and Mitchell (1979) and Williams and Batten (1981).

Summary

The socialization literature points out that the relationship between an institution and its members is reciprocal. Organizations make demands and structure rewards so that individuals will improve themselves and serve the interests of the organization. In this manner, organizations shape the experiences of individual members. This socialization cannot be successful, however, unless the organization is, to some degree, responsive to the needs of its members. By taking the needs of individuals into account, the requirements of the organization becomes, to some extent, determined by its members. Through the process of accommodating both individual and institutional needs, people shape organizations and are shaped by them.

Where the mandate of an organization is to change its clients, as is the case for all educational organizations, the principles of learning need to be taken into account. For long term learning to occur, a blend of power and affect must be

used. In other words, clear demands for change in a specific attribute of the students must be made, while sufficient emotional support is provided so that their integrity is sustained.

Given this theoretical perspective, our conceptualization of the quality of life of university students contains two domains, the cognitive domain and the affective domain. Universities need to attend to both these domains of students' life, since cognitive development, the main objective of universities, requires a supportive emotional climate. Thus, it follows that measuring the quality of life of university students needs to take into consideration both of these domains. This chapter has outlined the conceptualization of each of these domains as they are used in our attempt to measure the quality of life of university students.

The following chapter builds upon these theoretical considerations and presents the methodology used to develop measures of these two conceptualizations. The chapter begins with a description of the sample we used. Following this, a justification of the instruments we employed is presented. The chapter concludes by describing the initial measures we developed for each of the two quality of life domains.

CHAPTER 3

THE RESEARCH METHODOLOGY

We have argued that the quality of student life in a university is comprised of both the cognitive and affective domains. We also specified that each of these domains contained several dimensions. So far, our presentation of these two domains has been theoretical. This theoretical specification is a necessary step in the research process since it provides the context and rationale for more specific work. In this monograph our specific goal is to develop and empirically test two instruments for measuring the quality of life of university students. This chapter describes the sample, the instruments, and the initial procedures we used to develop questionnaire items for both the cognitive and the affective domains.

The Sample

As previously noted, this research project developed from a problem in applied sociology. A faculty of education at a large provincial university in Canada was required to evaluate its structure, procedures, and programmes. One aspect of this research involved assessing the quality of the undergraduate and graduate student experiences in the faculty. The authors were members of a sub-committee that was responsible for developing the instruments and conducting the research on the quality of life of these students. Although the general strategy involved developing a theoretical rationale that could be applied to students in any university faculty, the specific research task required measuring the quality of life of students in a faculty of education. This specific focus is evident in the items which were developed to measure the cognitive and affective domains, and in the sampling procedures.

For this project, samples of undergraduate and graduate students were selected using two procedures. For the undergraduate students, we used a stratified random cluster procedure. That is, we identified courses that students were required to take within each year of the four-year Bachelor of Education Degree programme and the two-year Bachelor of Education Degree programme following a previous degree. Following this, we randomly selected classes of students until we obtained approximately 27 percent of the population of students within each academic year. Each of the instructors of the nineteen classes that were selected were contacted, and arrangements were made to collect data from all the students in these classes. Questionnaires were distributed and completed during class time.

Table 1 indicates the number of classes selected from each undergraduate year, their size, the number of questionnaires returned, and the response rate.

This table shows that our sample included 397 of the 1467 students registered in the undergraduate programmes. Our response rate included 301 students representing approximately 76 percent of those sampled. Some of the students were not present when the questionnaires were distributed, and a few students chose not to complete the questionnaires. In total, we obtained data from approximately 21 percent of the population of undergraduate education students.

TABLE 1**Sample Sizes and Response Rates for the Undergraduate Sample**

Group	Sample Size	Questionnaires Returned	Response Rate
First Year	98	77	79%
Second Year	62	42	68%
Third Year	72	58	81%
Fourth Year	151	110	73%
Wpg. Edn. Ctre.	14	14	100%
TOTAL	397	301	76%
Graduate Students	502	245	49%
TOTAL	899	546	61%

For the graduate students we collected the data by means of a mail survey. We selected a random sample of 40 percent of the graduate student population. This percentage was selected because we anticipated between a 50 and 60 percent response rate. As such, we expected that the proportion of respondents in both the graduate and undergraduate samples would be approximately equal. Thus, questionnaires were mailed to 502 of the 1381 students who were registered in graduate programmes. A copy of the questionnaire and a letter encouraging the students to participate in the research was mailed to each student. Follow-up letters were sent to the students who did not return the questionnaires. By the end of the data collection phase, which included two follow-up letters, 245 questionnaires were returned, representing a response

rate of approximately 49 percent. In other words, we had obtained completed questionnaires from approximately 18 percent of the students enrolled in graduate courses in the faculty of education.

In summary, a total of 899 questionnaires were distributed to representative samples of both undergraduate and graduate students, and 546 questionnaires were returned. This represents an overall response rate of approximately 61 percent. Clearly, the differences between the undergraduate and graduate response rates (76% versus 49%) suggest that the undergraduate student data are probably more representative of the population than are the graduate student data. Nonetheless, even the graduate student response rate is typical for mail survey questionnaires (Singleton, et al., 1988, p. 247) and is high enough to be considered adequate for most research purposes (Babbie, 1979, p. 335). Moreover, the sample is large enough to provide a reasonable degree of reliability since it is larger than the minimum of 100 cases that researchers typically recommend (Singleton, et al., 1988, p. 260). Some irregularities in the data collection process resulted in a small number of missing cases. Consequently, the data analysis was performed on slightly smaller sample sizes than those reported. This disparity, however, is unlikely to make any substantive difference to the findings or our interpretation.

The Instrument

As noted previously, the data were collected by self-administered questionnaires. Self-report data are common in the social sciences, and have typically been used in the research on quality of life. Such procedures, however, are not the only means of assessing the quality of life in universities. It is, for instance, feasible to imagine independent, outside investigators located in classrooms, lecture halls, or laboratories and making detached, direct assessments of quality of life based on their observations. Such measures are identified as "low inference" research techniques (Rosenshine, 1970), while our instrument is identified as a "high inference" technique, since it requires "the respondent to make a judgement about the meaning of classroom events" (Fraser, 1986, p. 3).

Although low and high inference techniques may be complementary, they have different advantages. At least four advantages of self-report measures justify their use in this study. First, self-report data provides useful information at comparatively low cost. Second, the students' assessments of the quality of their lives are probably more reliable than measures obtained from observations, since observations are usually conducted at only one point in time or over a fairly restricted period of time. In contrast, the self reports of students are based on an overall assessment including an extensive range of experience in a variety

of classrooms. Third, collecting data from a relatively large sample of students, and aggregating these into measures of classroom or faculty quality of life takes multiple perspectives into account, whereas observational data often only includes the viewpoint of a single observer. Finally, as Moos and David (1981, p. 61) note, "a phenomenological [self-report] approach provides important data that the objective observer, who counts cues or behaviours, may miss...." In short, the sample and the instrument used in this study are both reasonable in comparison to previous research.

This is an exploratory study with the purpose of developing instruments to measure the quality of university student life. Exploratory studies involve considerable uncertainty because the topics studied contain unresolved problems in conceptualizing and operationalizing the measures. For example, the proposed theoretical dimensions may not be meaningful, or the suggested questionnaire items may not be measuring the dimensions, or the questionnaire items may be unreliable. Given these uncertainties, it is important to examine the adequacy of both the theoretical model and the empirical indicators that are proposed. This examination will identify deficiencies in our initial conceptualization and revisions will be suggested. Through the process of conceptualizing the problem, empirically testing the dimensions, and reconceptualizing the problem, we refine the proposed measures of the quality of university student life.

The remainder of this chapter is devoted to explaining two things. First, under the heading of content validity, we discuss the procedures employed to construct and select an initial set of indicators of each dimension of the two domains. Next we present an overview of the general empirical testing strategy we employed to establish the validity of our measures "to ensure that the items we combine into a scale are all measuring a single theoretically meaningful construct" (Piazza, 1980, pp. 584-585). The procedures we use are relatively new ones developed explicitly for constructing and selecting items for social research scales. These techniques appear to hold considerable promise for educational research and one of our goals is to demonstrate their utility. Essentially, the steps in the procedure are designed to be progressively more stringent at distinguishing between appropriate and inappropriate indicators. While the remainder of this chapter introduces the general logic of these procedures, the specific applications of these techniques to our proposed measures are left to the following two chapters.

Establishing Content Validity

Since there were no empirical indicators for measuring the quality of life of university students in either the cognitive or affective domains, our first task was to generate indicators for each of the dimensions within each of the two domains. In order to do this, we used the conceptual definition of each dimension to develop a set of plausible indicators. This initial list of indicators was then subjected to a content validity assessment.

Content validity concerns two issues, face validity and sampling validity (Nachmias & Nachmias, 1987; Smith & Glass, 1987). Face validity is concerned with whether or not the indicators seem to be plausible measures of the concept. Sampling validity is concerned with the extent to which a sufficient number and variety of indicators are used in order to capture the nuances of each dimension. Typically, face validity is assessed before sampling validity, since the plausibility of the indicators must be established before their representativeness can be examined.

In order to establish the content validity of the indicators we developed for each dimension of the cognitive and affective domains, the questionnaire items were assessed by a panel of judges representing undergraduate students, graduate students, and faculty members. These judges reviewed each item representing a specific dimension in terms of its clarity and the degree of correspondence between the item and the conceptual definition. After several revisions of the indicators, a parsimonious set of items for each dimension of the two domains was identified. At this stage the judges had agreed that these indicators had both face and sampling validity for the dimensions that they were designed to measure. This resulted in a preliminary set of indicators for each dimension of each domain.

The items for the dimensions of the cognitive domain are presented in Table 2, and the items for the dimensions of the affective domain are presented in Table 3. On the questionnaire, all of the cognitive domain items were prefaced by the phrase, "In the Faculty of Education I have learned..." So, for example, respondents would read the first item as "In the Faculty of Education I have learned a considerable amount about the subject matter I plan to teach." All of the items measuring the affective domain were prefaced by the phrase, "The Faculty of Education is a place where..." So, for example, the respondents would read the first item as "The Faculty of Education is a place where I find it easy to get to know other people." Each item contained a set of five responses including Definitely Agree, Mostly Agree, Neutral, Mostly Disagree, and Definitely Disagree. Copies of the questionnaire showing the format of the items are available from the authors.

TABLE 2

**Original Items Designed to Measure
The Six Dimensions of the Cognitive Domain**

Knowledge Dimension

- A considerable amount about the subject matter I plan to teach.
- A considerable amount about the methodology of teaching.
- The professional responsibilities of teachers.
- A considerable amount about the psychological development of children.
- A considerable amount about the socio-emotional development of children.

Comprehension Dimension

- To communicate clearly the subject matter I plan to teach.
- To write in a precise manner.
- To plan appropriate learning activities.
- To speak in a clear and concise manner.

Application Dimension

- To evaluate the socio-emotional performances of students.
- To present lessons in a systematic manner.
- To evaluate the academic performance of students.
- To use a variety of teaching strategies.
- To use a variety of ways to maintain classroom discipline.

Analysis Dimension

- To analyze the theoretical perspectives of education.
- To assess teaching as a profession.
- To analyze teaching in terms of various models of teaching.

Synthesis Dimension

- To synthesize various perspectives in the subject I plan to teach.
- To combine elements of knowledge into new perspectives.
- To combine various teaching techniques.
- To combine information from a number of sources.

Evaluation Dimension

- To evaluate theoretical perspectives in education.
 - To evaluate the subject areas I plan to teach.
 - To examine my own teaching critically.
 - To evaluate theories of classroom management.
-

TABLE 3

**Original Items Designed to Measure
The Six Dimensions of the Affective Domain**

Positive Affect Dimension

- I find it easy to get to know other people.
- I enjoy being.
- Students are friendly.
- I really like to go each day.
- I find that learning is a lot of fun.

Negative Affect Dimension

- I feel depressed.
- I feel restless.
- I feel lonely.
- I get upset.
- I feel worried.

Status Dimension

- I feel proud to be a student.
- People look up to me.
- People care about what I think.
- I am treated with respect.
- People think a lot of me.
- I feel important.
- I feel proud of myself.
- I get on well with other students in my class.

Identity Dimension

- The things I learn are important to me.
- Mixing with other people helps me understand myself.
- I am a success as a student.
- I learn to get along with other people.
- Other students accept me as I am.
- I have learned to work hard.

Professors Dimension

- Professors treat me fairly.
 - Professors give me the marks I deserve.
 - Professors take a personal interest in helping me with my work.
 - Professors help me do my best.
 - Professors are fair and just.
 - Professors listen to what I say.
-

TABLE 3 continued

Opportunity Dimension

- I really get involved in my work.
- I like learning.
- I have acquired skills that will be of use to me.
- I achieve a satisfactory standard in my work.
- The things I learn will help me in my life.
- I know how to cope with work.
- I am given a chance to do work that really interests me.
- I know I can do well enough to be successful.
- The things I am taught are worthwhile learning.
- The work I do is good preparation for my future.

The General Strategy

The content validity procedures help to establish a set of plausible items for each dimension of the two theoretical domains. In total, the set of items appear to us, as well as the students and faculty members who acted as independent judges, to capture the meaning of each dimension. Several items are included to measure each dimension because a single item often contains considerable measurement error. As Singleton et al. (1988, p. 63) note "...it is difficult to measure a concept well with a single indicator or question. Not only do single indicators rarely capture all the meaning of a concept, but each is likely to have distinctive sources of error or bias. By combining several indicators into a composite measure, we generally get a better overall representation of the concept and the errors tend to cancel each other out, yielding a more reliable measure."

Although the content validity procedures have established the plausibility of the items and the argument for multiple measures is appealing, substantial problems remain, especially for exploratory studies like this study. The critical problem is that while we are developing indicators of the theoretical dimensions, we realize that our theoretical constructs may be deficient. In other words, both theoretical and methodological issues are problematic in this type of exploratory research. This situation creates practical problems for traditional validity tests, since findings which do not confirm theoretical propositions may indicate either methodological deficiencies, such as poorly worded questions, or theoretical problems, such as multidimensional concepts.

Addressing these concerns requires a validity testing procedure that considers both theoretical and methodological issues. As Piazza (1980, p. 585) notes, "we need to develop measurement procedures that at least attempt to evaluate the coherence and relevance of operationally defined measures." To

accomplish this goal we used Piazza's (1980) procedures to assess the validity of the items proposed to measure the affective and cognitive domains of the quality of university student life.

Piazza's procedure uses a number of standard statistical techniques to analyze inter-item covariation as well as the covariation of items with selected exogenous variables. As such, the procedure assesses construct validity, which indicates the degree to which items reflect the concept and the extent to which they consistently relate, in terms of direction and strength, with exogenous variables in ways that are theoretically meaningful (Carmines & Zeller, 1979, pp. 22-26). Recently, more sophisticated techniques have been used to enhance the construct validity of instruments. Although these procedures have been used primarily by psychologists, sociologists are also showing a greater concern for the construct validity of their instruments. On this account, Piazza's procedure is useful for social researchers developing attitudinal scales. Using these techniques enhances both the process and product of this project. Methodologically, our research demonstrates the utility of employing a set of techniques, such as those suggested by Piazza, for establishing the construct validity of scales used in educational research. Substantively, we argue that our research provides a theoretically informed set of items that measure, in a meaningful way, the quality of life of university students.

Summary

In this chapter several methodological characteristics of this research project were reviewed. Specifically, we discussed the sample and noted that it was representative of the undergraduate and graduate students in a faculty of education. Moreover, we noted that using a self-administered questionnaire was appropriate to the research task. Following this, we described the process for establishing both the face validity and sampling validity of the original set of items measuring the dimensions of the cognitive and affective domains. Finally, we proposed that Piazza's (1980) procedure for establishing reliable and valid scales are relevant to the development of our instruments. In Chapter 4 we apply Piazza's procedure to the items measuring the six dimensions of the affective domain, and in Chapter 5 we apply the procedure to the items measuring the six dimensions of the cognitive domain.

CHAPTER 4

THE ANALYSIS OF THE AFFECTIVE DOMAIN

The objective of this study is to construct a valid instrument for measuring the quality of life of university students. As we previously noted, we identified both affective and cognitive domains of the quality of life. In this chapter, the analyses of the affective domain are presented, while the analyses of the cognitive domain are presented in Chapter 5. The justification for dividing the results into two chapters is that Piazza's procedures involve several steps which must be discussed in detail. Consequently, to help readers understand these procedures, we present the analyses of the affective domain, which is the simpler set of analyses, in this chapter, and then we present the analyses of the cognitive domain, which is a much more complex set, in the next chapter. This chapter explains each step of the analyses in considerable detail, so that readers will understand them. With this understanding in place, such detailed description is not necessary in Chapter 5, which focuses on reporting the results for the cognitive domain.

Factor Analyses of the Affective Domain Items

The content validity procedures discussed earlier suggested that, in the view of the judges, the items reported in Table 3 appear to be plausible indicators of the six dimensions of the affective domain. A more detailed assessment of these items begins by examining the extent to which they represent the six dimensions identified by Williams and Batten (1981). In other words, if the items are consistent with the theory, then those measuring the separate dimensions should cluster together. Factor analysis is a statistical procedure for determining if items cluster together in terms of distinctive theoretical constructs (Harman, 1967; Stinchcombe, 1971; Stinchcombe & Wendt, 1975). In other words, factor analysis is a procedure which examines patterns of covariation among items to determine if these patterns are congruent with the theoretically specified constructs (Kim & Mueller, 1978a, p. 9).

Factor analysis involves two steps. The first step is to extract a number of common factors from the correlations between the items, while the second step is to rotate the factors so that they can be interpreted. In factor analysis, the standards of simple structure and parsimony are paramount, as Rummel (1970, pp. 376-377) explains:

The simple structure goal of rotation, or what is sometimes called the multiple factor solution, is achieved by rotating the factors around the origin until each factor is maximally

collinear with a distinctive cluster of vectors. The shift is from factors maximizing total variance to factors delineating separate groups of highly intercorrelated variables... One major goal underlying the use of simple structure is to make our model of reality as simple as possible. If phenomena can be described equally well using fewer factors, the principle of parsimony is that we should do so. Simple structure maximizes parsimony by transforming from a solution accounting for the variance of a variable by several factors to a solution accounting for this variance by one, or at the most two, factors.

In order to extract the fewest common factors from the items measuring the affective domain, the analysis began by computing Pearson product-moment correlation coefficients between all the items. This correlation matrix contained 780 coefficients and is not reported in this monograph; it is, however, available from the authors. This correlation matrix was factor analyzed. Because the theory specified that the affective domain contained six dimensions, six factors were extracted from these items. In following this procedure, we expected that each item would load on one, and only one, factor. If this expectation was supported then it would confirm that there is an alignment between our theory about six dimensions in the affective domain and the items we have constructed.

In our analysis we used a principal components analysis which defines the factors in terms of an exact mathematical transformation of the correlation matrix. In this procedure the diagonal of the correlation matrix is not altered; it remains composed of unities which is the actual correlation of each item with itself. Furthermore, the principal component analysis extracts the greatest amount of variance for each successive factor (Kim & Mueller, 1978b, pp. 14-21). This implies that the first factor extracted is the best summary of the linear relationships exhibited in the data, the second factor extracted is the second best summary, and so on.

After extracting the factors, the next step in the procedure involves rotating the factors. The original factor matrix is rotated so that it is easier to interpret the factor loadings in terms of the simple structure criterion. Unrotated factors are statistically exact, but when the loadings are inspected, it is often difficult to detect meaningful patterns of factor loadings. Rotating the factors means that a simple, and more meaningful, linear transformation of the original factors is computed (Kim & Mueller, 1978b, pp. 29-41). This procedure does not change the basic interrelationships between the factors and the items, it only makes it

easier to interpret the results. Orthogonal and oblique rotations are the two basic ways that factor matrices may be rotated. Because our work is based on the scales developed by Williams and Batten (1981), we followed their procedure of rotating the factors to the Varimax criterion, which is a standard orthogonal procedure.

There are a few rules of thumb that may be used in determining the number of meaningful factors that have been extracted from a correlation matrix. Of these, three rules are commonly employed. These rules are the eigenvalue value = 1 rule, the substantive interpretability and invariance of the factors, and the Scree-test (Kim & Mueller, 1978b, p. 42). As a way of guarding against accepting dubious results, we use all three of these rules in our analysis.

The results of the initial factor analysis are reported in Table 4. Following the proposition that a factor should explain about ten percent of the variance in each item, it is conventional to accept as meaningful only loadings of 0.30 or larger. The amount of variance explained is determined by squaring the factor loading. Consequently, Table 4 contains only coefficients that are at least 0.30.

TABLE 4

Pattern Matrix Of The Affective Items After Varimax Rotation

Items	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆
Positive Affect						
1. I find it easy to get to know other people.			.74			
2. I enjoy being.	.69					
3. Students are very friendly.			.76			
4. I really like to go each day.	.66					
5. I find that learning is a lot of fun.	.65					
Negative Affect						
6. I feel depressed.				-.68		
7. I feel restless.	-.32			-.59		
8. I feel lonely.			-.35	-.64		
9. I get upset.				-.75		
10. I feel worried.				-.78		

TABLE 4 continued

Items	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆
Status						
11. I feel proud to be a student.	.70				.31	
12. People look up to me.	.41				.64	
13. People care about what I think.		.55			.38	
14. I am treated with respect.		.61			.40	
15. People think a lot of me.			.33		.59	
16. I feel important.	.30				.63	
17. I feel proud of myself.	.51				.36	.39
18. I get on well with other students in my class.			.66			
Identity						
19. The things I learn are important to me.	.75					
20. Mixing with other people helps me to understand myself.	.31		.50			
21. I am a success as a student.						.70
22. I learn to get along with other people.			.55			
23. Other students accept me as I am.			.62			
24. I have learned to work hard.	.60					
Professors						
25. Professors treat me fairly.		.73				
26. Professors give me the marks I deserve.		.64				
27. Professors take a personal interest in helping me with my work.		.64			.39	
28. Professors help me do my best.		.68				
29. Professors are fair and just.		.85				
30. Professors listen to what I say.		.61				
Opportunity						
31. I really get involved in my work.	.65					
32. I like learning.	.74					
33. I have acquired skills that will be of use to me.	.69	.33				
34. I achieve a satisfactory standard in my work.	.36	.43				.42
35. The things I learn will help me in my life.	.71					
36. I know how to cope with work.						.64
37. I am given the chance to do work that really interests me.	.64					
38. I know I can do well enough to be successful.						.69
39. The things I am taught are worthwhile learning.		.85				
40. The work I do is good preparation for my future.	.75					
Eigenvalues	13.44	2.96	2.70	2.03	1.42	1.25
Percent of total variance	33.6	7.4	6.8	5.1	3.5	3.1
Percent of common variance	56.5	12.9	11.4	8.6	5.9	5.2

These results contain three important points. First, it is notable that Factor 1 explains more than a third of the total variance in all of the items, while the other five factors explain less than a third of the total variance. Thus, Factor 1 is relatively powerful in comparison with the other factors. Second, thirteen items, about a third of the total number, load on two or three factors. Third, the items measuring Negative Affect (Factor 4), Status (Factor 5), and Professors (Factor 2) are clearly evident in the factor loadings, while the items measuring General Affect, Identity, and Opportunity are not so apparent.

On balance, these results indicate that the criteria of simple structure and parsimony are not met for a considerable number of items and dimensions. Moreover, examining the factors for invariance, and comparing them to the factor loadings reported by Williams and Batten (1981), leads us to believe that three of the factors are not interpretable. Finally, the Scree-test, advocated by Cattell (1965), directs us to examine the graph of eigenvalues and stop extracting factors when the eigenvalues level off at an almost horizontal plane. This test suggests there are probably only four factors which summarize these forty items.

Taken together, these results are not encouraging. Specifically, the results do not confirm the content validity test, which suggested that we had identified six distinctive dimensions of the Affective Domain. Clearly, more analyses are required to clarify the pattern of factor loadings in this data so that adjustments to our theoretical conceptualization may be made. Consequently, we proceeded to conduct a number of analyses extracting fewer factors, and we compared the findings for all of these analyses. Most of these analyses produced similar results, but one analysis was clearly more interpretable than the others. This result was a principal component analysis in which four factors were extracted and then rotated to meet the Oblimin criterion, which is a standard oblique procedure for rotating factors.

There are two reasons for considering the dimensions of the affective domain to be correlated, and thus to rotate the factors to an oblique criterion. The first is the epistemological assumption that all human characteristics, particularly attitudes, are interrelated. This assumption was already made when we assumed that there were six interrelated dimensions of the affective domain. The initial factor analysis reported in Table 4 supports this assumption because the first factor explains more than 4.5 times as much of the total variance as the second factor. The second reason for using an oblique rotation is that the items central to a cluster will have high loading on a single factor whereas this may not be true when an orthogonal rotation is used. Additionally, if the data contain factors that are actually unrelated, an oblique rotation demonstrates that this is

the case, where an orthogonal rotation only assumes that it is the case. Consequently, a more rigorous test of the assumption of orthogonality can be made by using an oblique rotation of factors (Kim & Mueller, 1978b, p. 37).

The results of this second factor analysis are reported in Table 5. In order to have these results conform to the criteria of simple structure and parsimony, we eliminated six items which, despite our series of analyses, continued to load on two or more factors. In this table it is clear that Factor 1 represents a Positive Affect dimension, which reflects the values associated with participating in the learning process and experiencing learning activities as being useful. This dimension includes fourteen items which Williams and Batten (1981) identify as General Affect, Positive Affect, Status, and Identity. Factor 2 represents an Interaction with Students dimension which concerns how easy it is for students to get to know other students. Factor 3 is clearly an Interaction with Professors dimension and reflects the perceptions students have about the way they are treated by their professors. This factor is similar to the Teacher Dimension identified by Williams and Batten (1981). Finally, Factor 4 is clearly a Negative Affect dimension which reflects the feelings of depression, restlessness, and worry that students sometimes experience.

TABLE 5

Pattern Matrices Of Selected Affective Items After Oblique Rotation

Items	Unrotated				Rotated			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
Positive Affect								
1. I feel proud to be a student.	.67	-.35			.79			
2. The things I learn are important to me.	.69	-.36			.79			
3. People look up to me.	.51				.53			
4. I really get involved in my work.	.65				.72			
5. I like learning.	.72	-.35			.79			
6. I enjoy being.	.75				.72			
7. I have acquired skills that will be of use to me.	.72				.65			
8. The things I learn will help me in my life.	.70				.69			
9. I am given the chance to do work that really interests me.	.69				.62			
10. The things I am taught are worthwhile learning.	.77				.73			
11. I really like to go each day.	.73				.69			
12. The work I do is good preparation for my future.	.67	-.33			.76			

TABLE 5 continued

Items	Unrotated				Rotated			
	F ₁	F ₂	F ₃	F ₄	F ₁	F ₂	F ₃	F ₄
13. I have learned to work hard.	.55		.41		.67			
14. I find that learning is a lot of fun.	.72				.69			
Interaction with Students								
15. I find it easy to get to know other people.	.35	.46	.31	-.33		.75		
16. Students are very friendly.	.32	.48		-.37		.75		
17. Mixing with other people helps me to understand myself.	.53		.30			.43		
18. People think a lot of me.	.45	.37				.47		
19. I learn to get along with other people.	.42		.35			.52		
20. Other students accept me as I am.	.42	.46				.67		
21. I get on well with the other students in my class.	.41	.43	.35			.72		
Interaction with Professors								
22. Professors treat me fairly.	.55		-.41					-.81
23. Professors give me the marks I deserve.	.53		-.33					-.68
24. I achieve a satisfactory standard in my work.	.61							-.46
25. People care about what I think.	.67	.33						-.61
26. Professors take a personal interest in helping me with my work.	.60	.32						-.76
27. I am treated with respect.	.67	.33						-.70
28. Professors help me to do my best.	.64							-.74
29. Professors are fair and just.	.60	-.46						-.80
30. Professors listen to what I say.	.66							-.62
Negative Affect								
31. I feel depressed.	-.50		.39	.41				.66
32. I feel restless.	-.51			.36				.55
33. I get upset.	-.43		.51	.47				.77
34. I feel worried.	-.36		.46	.56				.79
Eigenvalues	12.06	2.71	2.42	1.69				
Percent of Total Variance	35.5	8.0	7.1	5.0				
Percent of Common Variance	63.8	14.4	12.8	9.0				

Earlier we argued that, in the present case, factor analysis using oblique rotation was preferable to orthogonal rotation. Inspection of the correlations between the four factors of the Affective Domain provides empirical support for this argument. Specifically, Positive Affect and Interaction with Students are positively correlated (0.33), Positive Affect and Interaction with Professors are negatively correlated (-0.50), Positive Affect and Negative Affect are negatively correlated (-0.21), Interaction With Students and Interaction With Professors are negatively correlated (-0.32), and Interaction With Professors and Negative Affect are positively correlated (0.26).

The results of these factor analyses reveal dimensions that are slightly different from those identified by Williams and Batten (1981). This indicates that Williams and Batten's theory, which was developed for secondary school students, may not apply directly to university students. Nonetheless, their theoretical and empirical work provided a point of departure from which we have identified four dimensions of the affective domain. As such, these results warrant further validity testing.

Correlations Between the Affective Items and the Exogenous Variables

In constructing scales, researchers are often satisfied with the validity of items if they have face validity, high factor loadings on a single factor, and high reliability coefficients. The results reported in Table 5 show that the items selected for each of the four dimensions have high factor loadings on single factors. Consequently, many researchers would probably accept these items as having construct validity.

Piazza (1980, p. 588) argues, however, that constructing scales based on these three criteria ignores another critical issue. The problem is that those items which have been selected may be also measuring concepts other than the specified dimensions. This is not a serious difficulty if the other terms are not correlated with theoretically relevant variables. As Piazza (1980, p. 588) notes, "if the unique components of each item are not systematically related to other variables in the domain of our study, they can be classified as 'measurement error' and ignored." On the other hand, if the items are related to theoretically relevant variables, serious distortions may result. Specifically, the correlations between scales composed of such items and theoretically relevant variables may be attenuated because of invalidity, with the result that in computing a scale from the items "we would cover up what is actually going on" (Piazza, 1980, p. 589).

To address this challenge to the validity of items, Piazza recommends analyzing the correlations between the items and a set of theoretically relevant

exogenous variables. The specific task is to determine if consistent relationships are evident (Stinchcombe & Wendt, 1975, pp. 70-73). If consistent relationships do exist, then we have greater assurance that construct validity of the items has been established (Carmines & Zeller, 1979, p. 26; Piazza, 1980, p. 589).

In this procedure we used three exogenous variables, grade point average (GPA), gender, and father's education. Research in the sociology of education suggests that students with higher GPA's will probably have more positive affective dispositions than students with lower GPA's, females will probably have more positive dispositions than males, and little relationship probably exists between father's education and the affective dispositions of university students. In this study GPA was measured on a six-point scale which ranged from less than 2.0 (3) to between 4.0 and 4.5 (8), gender was measured on a two-point scale coded as 1 for males and 2 for females, and father's education was measured on a nine-point scale which ranged from completed elementary school (1) to completed a graduate degree (9).

The correlations between the exogenous variables and the items representing the four dimensions of the affective domain are reported in Table 6. When examining this table it is important to keep in mind that we are searching for consistent patterns of relationships between the set of items representing each dimension and the three exogenous variables. In other words, we are looking for similar profiles of correlations between the items and the exogenous variables. Generally, we see in this table that there are consistent trends in the patterns of correlations between the items measuring each dimension and the three exogenous variables. For example, in the Positive Affect dimension, all fourteen items generally have positive correlations with both GPA and gender as well as negative correlations with father's education. Item 1, however, is an exception because it has a slight negative correlation with GPA. There are also a few other exceptions of this sort in the table.

TABLE 6

**Correlations Of The Items Measuring The Four Affective
Dimensions With Three Exogenous Variables**

Item Numbers	G.P.A.	Gender	Father's Education
Positive Affect			
1.	-.02	.11	-.10
2.	.15	.12	-.10
3.	.09	.04	-.07
4.	.20	.13	-.13
5.	.12	.12	-.07
6.	.08	.12	-.09
7.	.08	.07	-.06
8.	.04	.07	-.09
9.	.10	.06	-.11
10.	.17	.10	-.15
11.	.13	.10	-.09
12.	.09	.08	-.11
13.	.07	.14	-.12
14.	.06	.09	-.06
Interaction with Students			
15.	.10	-.02	.04
16.	.06	-.07	.05
17.	.09	.05	-.05
18.	.22	.01	.04
19.	-.05	-.04	.03
20.	.12	.03	.03
21.	.13	-.04	.04
Interaction with Professors			
22.	.21	-.04	-.09
23.	.19	.08	-.10
24.	.23	.08	-.08
25.	.16	.02	-.04
26.	.14	.02	-.05
27.	.23	.02	-.14
28.	.17	-.02	-.07
29.	.17	-.03	-.08
30.	.17	-.04	-.01
Negative Affect			
31.	-.20	-.01	.07
32.	-.17	-.06	.05
33.	-.12	-.02	.04
34.	-.13	.07	.07

The similarities in the pattern of relationships between the items and the exogenous variables is more obvious when one examines graphs of these profiles. These graphs are reported in Figures 1, 2, 3 and 4. In these figures, the correlations of each item with each of the three exogenous variables is plotted and the points are connected. In Figure 1, for instance, it is clear that the profile for Item 1 is quite different from the profile for the other thirteen items identified as measuring the Positive Affect dimension. Similarly, in Figure 2, the profiles for Items 15 and 21, measuring the Interaction with Students dimension, are similar to each other but are different from the profile for Item 19. In Figure 3, all nine of the items measuring the Interaction With Professors dimension have similar profiles. Finally, in Figure 4, similar profiles are evident for all four items measuring the Negative Affect dimension.

Figure 1
Correlation Profile for the Items Measuring Positive Affect

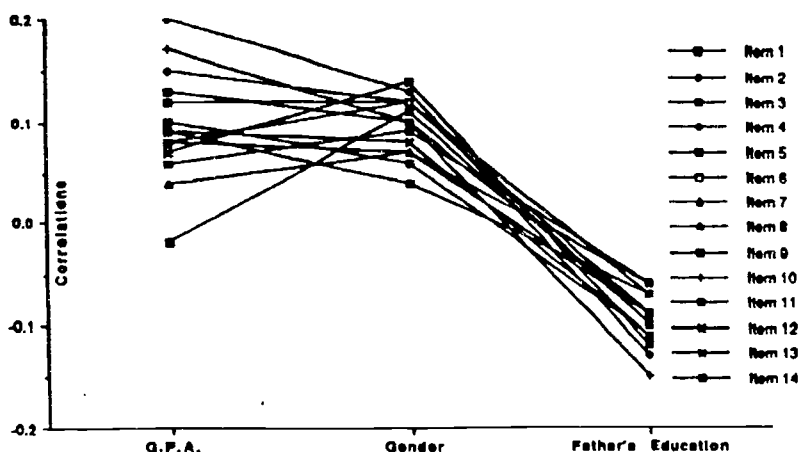


Figure 2
Correlation Profile for the Items Measuring Interaction with Students

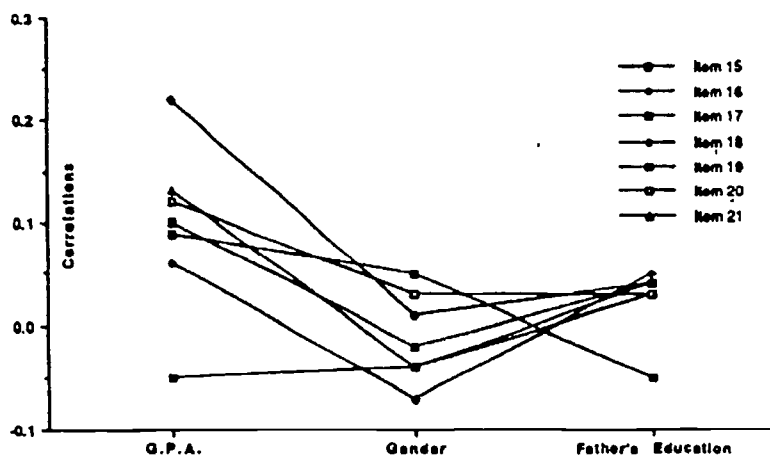
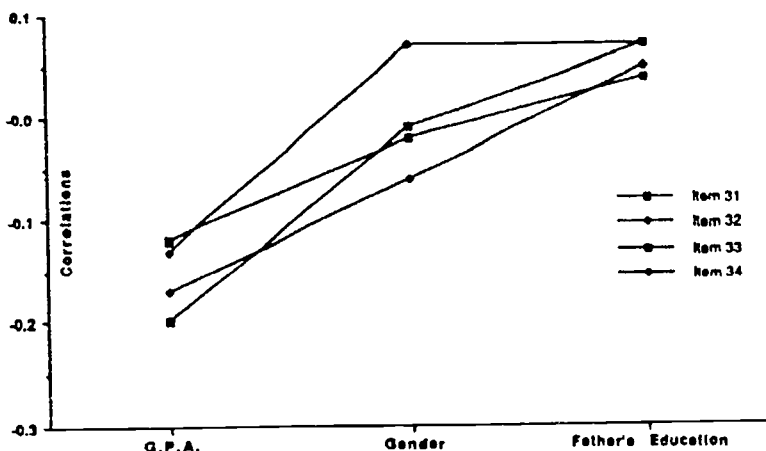


Figure 3
Correlation Profile for the Items Measuring Interaction with Professors



Figure 4
Correlation Profile for the Items Measuring Negative Affect



When several items are used to measure a dimension, it can be quite difficult to observe subtle similarities and differences in the profiles of the correlations. To assist in identifying items with similar profiles, Piazza (1980, pp. 591-595) has developed a statistical procedure summarized by the Index of Proportionality (p^2). The central idea of the procedure is that because "all the items need not measure the underlying construct with the same degree of efficiency, it is not necessary that each row of correlations be the same. One would expect, however, that the rows would be proportional" (Piazza, 1980, p. 592). In other words, similarities in the profiles of the correlations between items and the exogenous variables are important. For example, if the correlation of GPA with Item 3 is roughly half as large as the correlation of GPA with Item 4, for similarity to exist we would expect the correlation of Gender with Item 3 to be roughly half as large as the correlation it has with Item 4. Likewise, the correlation of Father's Education with Item 3 should be approximately half as large as the correlation it has with Item 4.

The p^2 statistic has the following property: "The statistic equals +1 if two items have exactly proportional correlations with each of the criterion [exogenous] variables. It equals -1 if the correlations are proportional but always of the opposite sign. It equals zero if there is no consistent proportionality" (Piazza, 1980, p. 592). Given this guideline, our task is to compute p^2 statistics for all the items in each dimension, and then look for

clusters of items with high proportionality. In this manner, the p^2 statistics provide another assessment of the construct validity of items.

The matrices of the p^2 s for the items in each of the four dimensions of the Affective Domain are reported in Table 7. An examination of the matrix for the items in the Positive Affect dimension illustrates that all of the items, except Item 1, have high p^2 s. In the matrix for the items in the Interaction with Students dimension, it is less clear which items have consistently high p^2 s. Nevertheless, inspecting the matrix suggests that items 15, 17, 18, 20, and 21 have relatively high p^2 s, while items 16 and 19 do not. In the matrix for the items measuring the Interaction with Professors dimension, all of the p^2 s are relatively high. Finally, in the matrix of items measuring the Negative Affect dimension, the only relatively low p^2 statistic is between items 32 and 34.

TABLE 7

**Matrices Of P^2 s For The Items Measuring The
Four Affective Dimensions**

Positive Affect												
Items	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.												
2.	.39											
3.	.28	.93										
4.	.33	.99	.97									
5.	.42	.98	.85	.95								
6.	.65	.92	.79	.88	.94							
7.	.44	.99	.93	.98	.98	.95						
8.	.77	.80	.76	.77	.77	.92	.84					
9.	.42	.91	.97	.93	.84	.85	.92	.87				
10.	.37	.96	.99	.98	.89	.86	.96	.83	.99			
11.	.38	.99	.95	.99	.97	.92	.99	.81	.93	.97		
12.	.54	.93	.93	.93	.88	.93	.95	.94	.98	.97	.94	
13.	.77	.85	.73	.80	.86	.98	.88	.96	.82	.81	.84	.91
14.	.63	.93	.78	.88	.96	.99	.95	.89	.82	.85	.92	.91
												.97
Interaction with Students												
Items	15.	16.	17.	18.	19.	20.						
15.												
16.		.67										
17.		.23	.00									
18.		.91	.38	.51								
19.		.15	.03	.98	.42							
20.		.82	.24	.55	.96	.49						
		.98	.72	.23	.88	.14	.75					

TABLE 7 continued

TABLE 7 Continued								
Interaction with Professors								
Items	22.	23.	24.	25.	26.	27.	28.	29.
22.								
23.	.74							
24.	.77	.98						
25.	.87	.89	.95					
26.	.91	.93	.97	.99				
27.	.92	.92	.90	.91	.96			
28.	.99	.79	.93	.93	.94	.94		
29.	.99	.76	.78	.89	.91	.94	.99	
30.	.89	.56	.67	.85	.80	.71	.88	.86
Negative Affect								
Items	31.	32.	33.					
31.								
32.	.92							
33.	.99	.97						
34.	.76	.49	.66					

Piazza (1980, pp. 594-595) recommends that these analyses should be supplemented by canonical correlations before a final selection of items is made. Canonical correlation helps determine if a set of items have one, and only one, systematic relationship with a set of exogenous variables. As such, the technique provides another way of assessing construct validity. Essentially, the canonical correlation technique allow us to compute coefficients that express the maximized linear relationship between two sets of variables. Specifically, canonical correlation analyses generates a number of variates equal to the number of variables in the smallest set, with each successive variate being orthogonal to the previous ones and explaining successively less of the variation between the two sets. Each of the variables "are combined to produce, for each side, a predicted value that has the highest correlation with the predicted value on the other side" (Tabachnick & Fidell, 1989, p. 193). As in factor analysis, variables with correlations of 0.30 and above, explaining approximately 10 percent of the variance, are typically interpreted as being part of the variate (Tabachnick & Fidell, 1989, p. 217).

Since the three exogenous variables comprised the smallest set in each of the four dimensions, each analyses generated three canonical variates. These variates were computed for each dimension of the affective domain in order to determine if the scale items had a single systematic relationship with the three exogenous variables. Table 8 reports only the first variate for the items in each of the four dimensions because this variate contains all the relevant information.

TABLE 8**Canonical Correlations Between The Items Measuring The Four Affective Dimensions And The Three Exogenous Variables**

	1st Analysis	2nd Analysis
Positive Affect Items		
1.	-.18	
2.	-.57	-.02
3.	-.33	-.35
4.	-.77	-.85
5.	-.53	-.60
6.	-.43	-.49
7.	-.28	-.32
8.	-.25	-.31
9.	-.36	-.41
10.	-.64	-.69
11.	-.42	-.45
12.	-.38	-.44
13.	-.41	-.49
14.	-.33	-.38
Exogenous Variables		
G.P.A.	-.83	-.72
Gender	-.47	-.59
Father's Education	.37	.43
Canonical Correlation (R)	.45	.52
Eigenvalue (R^2)	.20	.27
Redundancy	.03	.04
Interaction with Students Items		
15.	-.37	-.49
16.	-.11	
17.	-.34	-.37
18.	-.76	-.95
19.	.19	
20.	-.42	-.52
21.	-.49	-.60
Exogenous Variables		
G.P.A.	-.96	-.93
Gender	-.33	-.33
Father's Education	-.02	-.21
Canonical Correlation (R)	.42	.62
Eigenvalue (R^2)	.18	.38
Redundancy	.01	.02

TABLE 8 continued

	1st Analysis	2nd Analysis
Interaction with Professors Items		
22.	.56	
23.	.71	
24.	.76	
25.	.46	
26.	.41	
27.	.75	
28.	.49	
29.	.44	
30.	.33	
Exogenous Variables		
G.P.A.	.81	
Gender	.35	
Father's Education	-.52	
Canonical Correlation (R)	.57	
Eigenvalue (R^2)	.32	
Redundancy	.03	
Negative Affect Items		
31.	-.83	
32.	-.83	
33.	-.51	
34.	-.29	
Exogenous Variables		
G.P.A.	.81	
Gender	.58	
Father's Education	-.25	
Canonical Correlation (R)	.66	
Eigenvalue (R^2)	.43	
Redundancy	.02	

The first panel of Table 8 reports two analyses of the proposed items designed to measure the Positive Affect dimension. In the first analysis all fourteen items are included. A canonical correlation of 0.45 was obtained between the two variates, representing approximately twenty percent overlapping variance. In this table, three items, Items 1, 7, and 8, have scores lower than the usual cut-off level of 0.30. In other words, the principal linear relationship between these items and the exogenous variables seems to be defined by all the items except these three. Comparing this finding to the p^2 analysis confirms that at least Item 1 has poor construct validity. Consequently, Item 1 was dropped and the data were reanalyzed. This is the type of stepwise procedure suggested by Piazza (1980, pp. 598-599).

The canonical correlation coefficients for the new scale are reported in the second column of Table 8. With Item 1 excluded, the remaining thirteen items of the Positive Affect dimension have a consistent relationship with the exogenous variables. This is indicated by the fact that all the items load on the variate at or above 0.30. This relationship is also defined by positive relationships with GPA and gender, and a negative relationship with father's education. In other words, females and students with higher GPAs generally have higher scores on the Positive Affect dimension than males and students with lower GPAs, while students with less educated fathers generally have higher Positive Affect scores than students with better educated fathers. Moreover, the canonical correlation between the two variates has increased from 0.45 to 0.52, while the redundancy has remained about the same, 0.03 and 0.04 respectively. The redundancy is the proportion of the variance of the items in the scale which has been explained by the first linear combination of the three exogenous variables. As expected, this coefficient is small, which indicates that the three exogenous variables have different relationships with the set of thirteen items. This is a desirable characteristic.

In the second panel of Table 8 we report two analyses of the items measuring the Interaction with Students dimension. In the first analysis, all seven items are included and a canonical correlation of 0.42 is obtained, which explains approximately 18 percent of the overlapping variance between the two variates. However, Item 16 is lower than the usual cut-off level of 0.30 and Item 19 loads on the variate in an opposite direction from the other items. In short, these two items do not seem to contribute to the principal linear relationship between the items and the exogenous variables. This suggestion is corroborated by the p^2 analyses and, consequently, both items 16 and 19 were deleted before a second analysis was conducted.

The results of the reanalysis are reported in the second column of this panel and show the remaining items have consistently high relationships with the exogenous variables. Specifically, the coefficients range from -0.37 to -0.95. After items 16 and 19 were dropped from the analysis, the Interaction with Students dimension is defined by a high positive relationship with GPA and less positive relationships with gender and father's education. In the reanalysis, the canonical correlation between the two variates has increased from 0.42 to 0.62 while the redundancy has remained low.

In the third panel of Table 8 one analysis of the proposed measures of the Interaction with Professors dimension is reported. A canonical correlation of 0.57 was obtained between the variates, representing approximately 32 percent of the overlapping variance. All nine items in this dimension load on the variate

at 0.30 or above. We also note that this relationship is defined by positive relationships with GPA and gender, and a negative relationship with father's education. That is, students with higher GPAs, and females, generally have higher scores on the Interaction with Professors dimension than students with lower GPAs, and males, while students with fathers who have less education generally have higher scores on this dimension than students with fathers who have more education.

Finally, in the fourth panel of Table 8 we report one analysis of the items which compose the Negative Affect dimension. In this analysis all four items are included. A canonical correlation of 0.66 was obtained between the two variates, explaining approximately 43 percent of the variance. It is observed that item 34 is slightly lower than the usual cut-off limit of 0.30. In other words, this item contributes slightly less than the other three items to the principal linear relationship between the variate defined by these items and the variate defined by the three exogenous variables. Nevertheless, we decided to keep this item in the scale because the p^2 analysis suggested that it has a similar correlation profile as the other three items. The Negative Affect dimension is defined by very high positive relationships with GPA and gender, and a negative relationship with father's education. That is, students with high GPAs, females, and students with fathers who have less education are less likely to have negative dispositions than students with low GPAs, males, and students with fathers who have more education.

The Four Scales

In this chapter our task was to construct unidimensional scales measuring the four dimensions in the Affective Domain of the quality of university student life. The procedures we have used allowed us to select and organize thirty-one items into scales that contain considerably less error variance than existed in scales constructed by only using factor analyses. Consequently, we are quite confident in the construct validity of these four scales. Compared to previous research, our results are encouraging. For instance, Piazza (1980, p. 602) notes that these procedures have rarely resulted in the retention of more than four items per scale. In this context, the five item Interaction with Students scale and the four item Negative Affect scale are about average, while the thirteen item Positive Affect scale and the nine item Interaction with Professors scale are considerably above average.

The quality of new scales is typically summarized by reporting reliability coefficients of the constituent items. Cronbach's alpha reliability coefficient is one of the most common measures of the internal consistency of items (Carmines & Zeller, 1979, p. 44). This statistic ranges from 0, indicating no

internal consistency, to +1.0, indicating perfect internal consistency. The alpha coefficient is a lower-bound reliability estimate, which means that the true reliability of a scale is slightly higher than indicated. The level of acceptable reliability coefficients depends on the purposes of the research. When making decisions about particular individuals, reliability coefficients of more than 0.90 are preferred (Nunnally, 1967). For research purposes, however, Smith and Glass (1987, p. 106) note that moderate reliability coefficients, those over 0.50, are sufficient. Other researchers recommend that we "strive for indices with alphas of 0.70 or higher" (Bohrnstedt & Knoke, 1982, p. 361), while remembering that it is often very difficult to increase reliability coefficients beyond 0.80 (Nunnally, 1967, p. 226).

The four scales we developed for the affective domain hold up very well against these standards. The alpha reliability coefficient for Positive Affect is 0.93, Interaction with Students is 0.75, Interaction with Professors is 0.90, and Negative Affect is 0.79. These coefficients are similar in magnitude to the omega reliability coefficients calculated by Williams and Batten (1981, pp. 46-47). Even the coefficients for the Interaction with Students and the Negative Affect dimensions are well above the acceptable standards for research purposes.

Taken together, these results confirm that we have been able to construct four relatively valid scales to measure Positive Affect, Interaction with Students, Interaction with Professors, and Negative Affect, the four dimensions of the affective domain of the quality of life of university students.

Summary

In this chapter we used the procedures Piazza (1980) recommended for constructing unidimensional scales for measuring the dimensions of the affective domain of the quality of life of university students. The preliminary results using factor analysis suggested that some reconceptualization of the theoretical framework was necessary. After this was completed, the remaining empirical tests led to the construction of four scales measuring the Positive Affect, Interaction with Students, Interaction with Professors, and Negative Affect dimensions of the Affective Domain. Empirical evidence confirmed the construct validity and the reliability of each of these scales. In the next chapter we use these procedures to analyze the items which were designed to measure the Cognitive Domain of the quality of life of university students.

CHAPTER 5

THE ANALYSIS OF THE COGNITIVE DOMAIN

This chapter presents the analyses of the items proposed to measure the cognitive domain of the quality of life of university students. The theoretical relevance of this domain was presented in Chapter 2 where it was argued that students should experience the university as a "cognitively demanding" setting. The dimensions of this domain were developed from Bloom's taxonomy of educational objectives (Bloom, et al., 1956), and include knowledge, comprehension, application, analysis, synthesis, and evaluation. This chapter presents the questionnaire items for each of these dimensions and analyzes these items using the procedures recommended by Piazza (1980). The steps in this procedure were described in detail in Chapter 4 and are not repeated in this chapter. As in the previous chapter, our objective is to develop a set of scales that have construct validity.

Factor Analyses of the Cognitive Domain Items

In Chapter 3, Table 2 reported the items for each of the six dimensions of the cognitive domain that our panel of judges thought had content validity. The first step in determining the construct validity of these items involves factor analyzing them. The factor analysis is a statistical procedure for analyzing the pattern of correlations among the items to determine their congruence with theoretically specified constructs.

The correlations for all the items in the cognitive domain were calculated and factor analyzed using principal components analyses. This correlation matrix contains 300 coefficients and is not reported in this monograph, although it is available from the authors. Six factors were extracted in the first analyses in order to attempt to obtain the six theoretically defined dimensions of this domain. In order to meet the standards of simple structure and parsimony, the six factors were rotated to the Varimax criterion. The results of these analyses are reported in Table 9.

TABLE 9

Pattern Matrix Of The Cognitive Items After Varimax Rotation

Items	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆
Knowledge						
1. A considerable amount about the subject I plan to teach.		.72				
2. A considerable amount about the methodology of teaching.	.40	.41				-.36
3. The professional responsibilities of teachers.			.79			
4. A considerable amount about the psychological development of children.				.80		
5. A considerable amount about the social-emotional development of children.				.86		
Comprehension						
6. To communicate clearly the subject matter I plan to teach.		.71				
7. To write in a precise manner.		.40	.34			.46
8. To plan appropriate learning activities.	.63	.38				
9. To speak in a clear and concise manner.			.50			.39
Application						
10. To evaluate the social-emotional performance of students.		.32		.60		
11. To present lessons in a systematic manner.	.54	.38				
12. To evaluate the academic performance of students.	.65					
13. To use a variety of teaching strategies.	.79					
14. To use a variety of ways to maintain classroom discipline.	.49		.48	.31		
Analysis						
15. To analyze the theoretical perspectives of education.					.81	
16. To assess teaching as a profession.			.73			
17. To analyze teaching in terms of various models of teaching.	.50				.43	
Synthesis						
18. To synthesize various perspectives in the subjects I plan to teach.		.68			.32	
19. To combine elements of knowledge into new perspectives.		.43	.36		.33	.38
20. To combine various teaching techniques.	.75					
21. To combine information from a number of sources.	.30					.65

TABLE 9 continued

Items	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆
Evaluation						
22. To evaluate theoretical perspectives in education.					.80	
23. To evaluate the subject areas I plan to teach.		.60				.30
24. To examine my own teaching critically.	.57					.43
25. To evaluate theories of classroom management.	.43		.39	.31	.37	
Eigenvalues	8.25	1.90	1.71	1.37	1.23	1.03
Percent of total variance	33.0	7.6	6.8	5.5	4.9	4.1
Percent of common variance	53.3	12.3	11.0	8.9	7.9	6.6

On balance, these results are disappointing because they do not fit the pattern predicted by the theoretical perspective. One deficiency of this analysis is that the factors include items from several different dimensions. For example, Factor 1 contains several items from each of the six dimensions. Another deficiency of this analysis is that over 50 percent of the items load on two or more factors. For example, Item 2 loads on Factors 1, 2, and 6. Taken together, these deficiencies indicate that there is little congruence between the data and the six dimensions of the cognitive domain which were defined from the theoretical perspective. The fact that a large percentage of the items load on more than one factor suggests that the factors may be correlated. This idea was confirmed by an additional principal component analysis in which only one factor was extracted. The data from this analysis showed that all the items could load on one factor.

Given the interdependence of the factors, we proceeded to reanalyze the data using an oblique method of rotating the factors. An oblique rotation does not assume that the factors are independent of one another, and therefore seems appropriate for these items. Following our theoretical expectation, we extracted and obliquely rotated six factors in the first analysis. When the results of this procedure were compared with the results of the Varimax solution, it was clear that a six factor solution could not be sustained. Moreover, a Scree-test suggested that a three factor solution was probably more appropriate. This analysis was conducted and the results are reported in Table 10.

TABLE 10

Pattern Matrix Of The Cognitive Items After Oblique Rotation

Items	F ₁	F ₂	F ₃
Knowledge			
1. A considerable amount about the subject I plan to teach.		.69	
2. A considerable amount about the methodology of teaching.	.37		
3. The professional responsibilities of teachers.			.48
4. A considerable amount about the psychological development of children.			.64
5. A considerable amount about the social-emotional development of children.			.72
Comprehension			
6. To communicate clearly the subject matter I plan to teach.	.35	.49	
7. To write in a precise manner.		.61	
8. To plan appropriate learning activities.	.69		
9. To speak in a clear and concise manner.	.37		
Application			
10. To evaluate the social-emotional performance of students.			.55
11. To present lessons in a systematic manner.	.63		
12. To evaluate the academic performance of students.	.64		
13. To use a variety of teaching strategies.	.81		
14. To use a variety of ways to maintain classroom discipline.	.45	-.30	.56
Analysis			
15. To analyze the theoretical perspectives of education.		.47	.45
16. To assess teaching as a profession.		.30	.31
17. To analyze teaching in terms of various models of teaching.	.36		.41
Synthesis			
18. To synthesize various perspectives in the subjects I plan to teach.		.71	
19. To combine elements of knowledge into new perspectives.		.62	
20. To combine various teaching techniques.	.69		
21. To combine information from a number of sources.		.47	
Evaluation			
22. To evaluate theoretical perspectives in education.		.52	.44
23. To evaluate the subject areas I plan to teach.	.31	.60	
24. To examine my own teaching critically.	.58		
25. To evaluate theories of classroom management.			.66

The results in this table are encouraging because they begin to show a meaningful pattern of loadings. This pattern is apparent in the fact that approximately 75 percent of items load on a single factor. However, as in the previous analysis, the factors continue to include items from several

dimensions. This fact, in conjunction with the reduction in the number of factors from six to three, indicates that our theoretical perspective requires revision.

The next task involved formulating a new theoretical perspective from the existing data. This inductive approach for generating conceptualizations is called "grounded theory" by Glaser and Strauss (1967). The procedure we followed involved quantitative and qualitative considerations. First, we excluded seven items which continued to load on more than one factor. Next, we reviewed the items that loaded on each factor and tried to group them into sets sharing common themes. In this process two more items were discarded and, after several attempts, a reorganization of the items into three dimensions emerged. These new dimensions of the cognitive domain were labelled Methodology of Teaching, Development of Pupils, and Subject Expertise. This reconceptualization of these items was tested by subjecting them to an additional factor analysis. These results are reported in Table 11.

TABLE 11

Pattern Matrices Of Selected Cognitive Items After Oblique Rotation

Items	Unrotated			Rotated		
	F ₁	F ₂	F ₃	F ₁	F ₂	F ₃
Methodology of Teaching						
1. A considerable amount about the methodology of teaching.	.54			.50		
2. To plan appropriate learning activities.	.70			.71		
3. To present lessons in a systematic manner.	.61			.65		
4. To evaluate the academic performance of students.	.61			.68		
5. To use a variety of teaching strategies.	.68	-.47		.90		
6. To combine various teaching techniques.	.67	-.35		.79		
7. To examine my own teaching critically.	.67			.66		
Development of Pupils						
8. The professional responsibilities of teachers.	.49				.32	
9. A considerable amount about the psychological development of children.	.49	.49	-.38		.80	
10. A considerable amount about the social-emotional development of children.	.53	.58	-.44		.93	
11. To evaluate the social-emotional performance of students.	.55	.45			.67	

TABLE II - continued

Items	Unrotated			Rotated		
	F ₁	F ₂	F ₃	F ₁	F ₂	F ₃
Subject Expertise						
12. A considerable amount about the subject I plan to teach.	.53		.39			.68
13. To write in a precise manner.	.49		.54			.82
14. To synthesize various perspectives in the subject I plan to teach.	.62		.36			.68
15. To combine elements of knowledge in no new perspectives.	.63		.38			.70
16. To combine information from a number of sources.	.58		.38			.61
Eigenvalues	5.61	1.55	1.39			
Percent of Total Variance	35.1	9.7	8.7			
Percent of Common Variance	65.6	18.1	16.3			

In this table, the first set of columns report the factor loadings for the unrotated solution, while the second set of columns report the factor loadings for the rotated solution. In this table we only report factor loadings of at least 0.39. From the percentage of variance explained, it is evident that the first factor is relatively powerful in comparison with the other two factors. Specifically, the first factor explains almost 66 percent of the common variance, while each of the other two factors explains less than 20 percent. In the rotated solution, it is evident that three factors are clearly identified. Specifically, each item loads on only one factor and the factor loadings are relatively high. In short, these results provide support for our revised conceptualization of the cognitive domain. Furthermore, the correlation among the factors supports this position. Specifically, Methodology of Teaching and Development of Pupils have a correlation of 0.39, Methodology of Teaching and Subject Expertise are correlated at 0.48, and Development of Pupils and Subject Expertise have a correlation of 0.35.

Before proceeding to the remaining steps in the procedure for establishing construct validity, the nature of the reconceptualized cognitive domain needs to be identified. Our initial theoretical framework employed the taxonomy of educational objectives developed by Bloom et al. (1956). We argued that this model of the cognitive domain had general applicability since it was based on a set of standard stages of learning that extended from the acquisition of knowledge to the evaluation of arguments and evidence. Items that were relevant to students in a faculty of education were developed to reflect each of

these dimensions of learning. In short, we developed a model of the cognitive domain which we thought would apply to all university students, even though we intended to test the model on students in a faculty of education.

Unfortunately, this general conceptualization was not sustained by our empirical analyses. The empirical evidence suggests that these items indicated three dimensions of the cognitive content of the learning experiences of Education students. The result is a conceptualization of the cognitive domain of the quality of university student life that is specific to students in a faculty of education. Although somewhat disappointing, this kind of revision is common in exploratory research. While this change of focus restricts the future application of the instrument, the empirical support for the reconceptualization is relatively positive. In the next section we revise these items on the basis of further validity testing.

Correlations Between the Cognitive Items and the Exogenous Variables

So far, we have created dimensions of the cognitive domain that seem to have both content validity and high factor loadings on relevant factors. Following Piazza's (1980) recommendation the next task is to establish the construct validity of the measures. As we illustrated in the previous chapter, this is accomplished by selecting items that have consistent relationships with several theoretically relevant exogenous variables.

The exogenous variables used in this analysis were the same ones we used in the previous chapter: grade point average (GPA), gender, and father's occupation. The correlations between these exogenous variables and the items representing the three dimensions of the cognitive domain are reported in Table 12. As we noted in the previous chapter, we are looking for consistent relationships between the items which theoretically measure a dimension and the three exogenous variables in this table. Searching for these correlation profiles of similar structure is assisted by the graphs reported in Figures 5, 6, and 7.

TABLE 12

**Correlations Of The Items Measuring The Three
Cognitive Dimensions With Three Exogenous Variables**

Item Numbers	G.P.A.	Gender	Father's Education
Methodology of Teaching			
1.	-.01	-.04	-.05
2.	-.05	.06	-.03
3.	.06	.01	.04
4.	.01	-.01	-.05
5.	.02	.00	-.07
6.	-.02	.00	-.04
7.	.02	.02	-.04
Development of Pupils			
8.	-.17	.06	-.05
9.	-.08	.04	-.07
10.	-.14	-.01	-.04
11.	-.10	-.02	-.03
Subject Expertise			
12.	.04	.08	-.10
13.	.05	.01	-.10
14.	.11	.02	-.03
15.	-.04	-.02	-.07
16.	.03	.05	-.08

Figure 5

Correlation Profile for the Items Measuring Methodology of Teaching

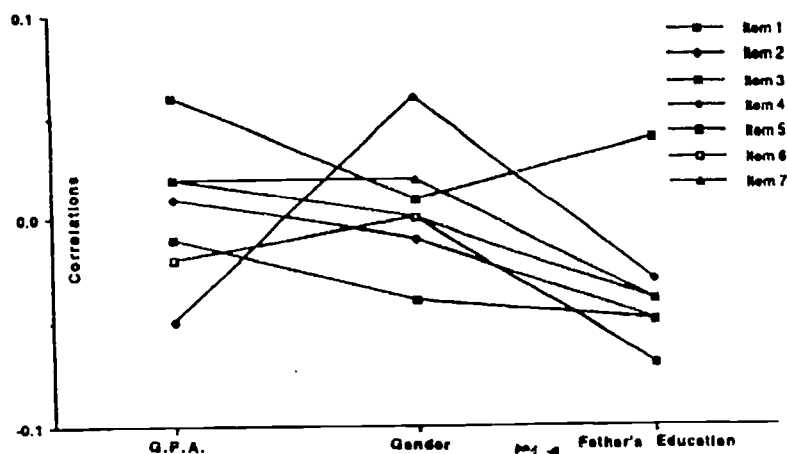


Figure 6
Correlation Profile for the Items Measuring Development of Pupils

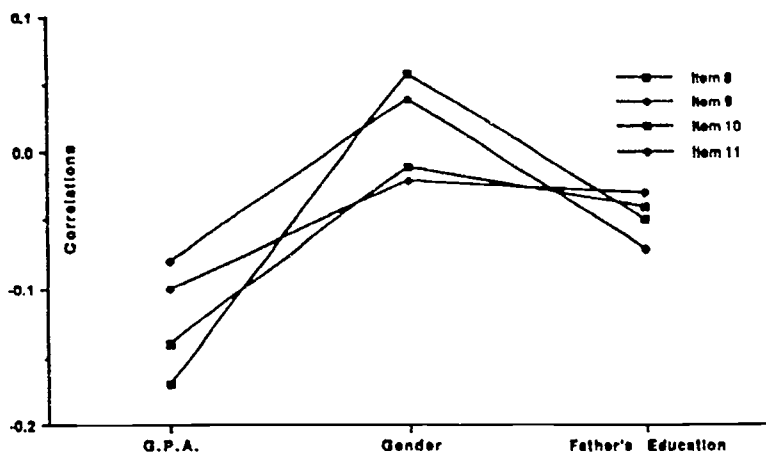
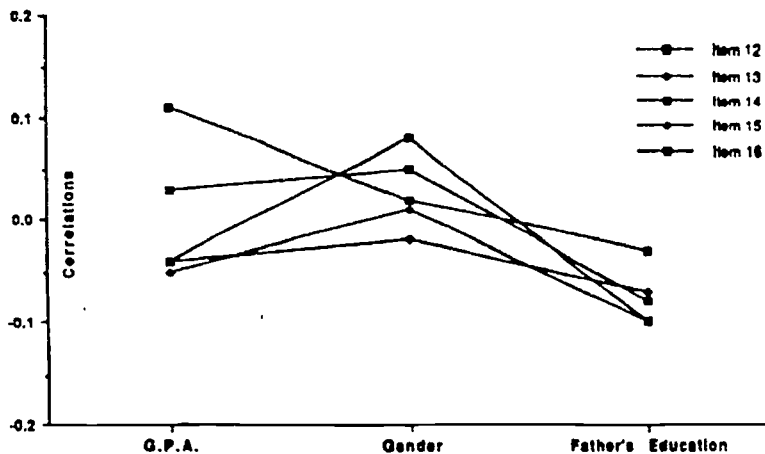


Figure 7
Correlation Profile for the Items Measuring Subject Expertise



Inspection of these profiles reveals that there are some inconsistencies in the profiles for some items. For instance, in Table 12 and Figure 5, the profiles for Items 2, 3, and 7 are quite different. In contrast, the four items measuring the Development of Pupils seem to be quite similar. Finally, in Table 12 and Figure 7, the pattern among the items measuring the Subject Expertise dimension seems to be quite unclear.

In Piazza's procedure this visual inspection of the data is supplemented by the calculation of an Index of Proportionality (p^2) which provides a statistical summary of the correlation profiles of the items with the exogenous variables. The matrices of p^2 s for the items measuring each of the three cognitive dimensions are reported in Table 13. These results generally confirm the patterns we reported from our inspection of the profiles of correlations in Table 12. The one feature that is clearer in Table 13 is that Item 15 in the Subject Expertise dimension appears to be the least consistent item in this set.

TABLE 13
Matrices Of P^2 s For The Items Measuring The
Three Cognitive Dimensions

Methodology of Teaching						
Items	1.	2.	3.	4.	5.	6.
1.						
2.	.01					
3.	.40	.35				
4.	.69	.01	.16			
5.	.49	.03	.09	.96		
6.	.58	.35	.74	.60	.54	
7.	.10	.12	.00	.62	.81	.30
Development of Pupils						
Items	8.	9.	10.			
8.						
9.	.84					
10.	.85	.67				
11.	.76	.59	.99			

Table 13 continued

Subject Expertise Items	12.	13.	14.	15.
12.				
13.	.72			
14.	.34	.45		
15.	.12	.27	.08	
16.	.99	.81	.34	.17

Before selecting a final set of items, Piazza recommends that these procedures be supplemented by a canonical correlation analyses. As noted previously, this statistical procedure assists in determining if the items for each scale have a single systematic relationship with the three exogenous variables. The results of this analysis are reported in Table 14.

TABLE 14

**Canonical Correlations Between The Items Measuring The Three
Cognitive Dimensions And The Three Exogenous Variables**

	1st Analysis	2nd Analysis
Methodology of Teaching Item #		
1.	.23	-.89
2.	-.67	
3.	-.03	
4.	-.11	-.30
5.	.13	-.63
6.	-.09	-.33
7.	-.17	
Exogenous Variables		
G.P.A.	.58	-.08
Gender	-.77	.53
Father's Education	-.15	.83
Canonical Correlation (R)	.28	.59
Eigenvalue (R^2)	.08	.35
Redundancy	.00	.00
Development of Pupils Item #		
8.	-.89	
9.	-.42	
10.	-.66	
11.	-.46	

TABLE 14 continued

	1st Analysis	2nd Analysis
Exogenous Variables		
G.P.A.	.93	
Gender	-.13	
Father's Education	.30	
Canonical Correlation (R)	.64	
Eigenvalue (R ²)	.41	
Redundancy	.02	
Subject Expertise Item #		
12.	.74	-.97
13.	.34	-.50
14.	.58	-.52
15.	-.17	
16.	.30	-.48
Exogenous Variables		
G.P.A.	.66	-.24
Gender	.71	-.77
Father's Education	-.35	.62
Canonical Correlation (R)	.47	.65
Eigenvalue (R ²)	.22	.42
Redundancy	.01	.01

The first panel of this table reports two analyses of the items proposed as measures of the Methodology of Teaching dimension. The first analysis included all of the items and resulted in a canonical correlation of 0.28, representing approximately 8 percent overlapping variance between the two variates. When the p^2 statistics were considered in conjunction with these loadings, we decided to include only items 1, 4, 5 and 6 in a second analysis in order to obtain a higher canonical correlation.

The canonical correlation results for the new scale are reported in the second column of Table 14. This set of items provide a marked improvement over the previous set. Specifically, the canonical correlation between the two variates has increased from 0.28 to 0.59, and the item loadings have the same sign and are all at least 0.30. The relationship of the scale items to the exogenous variables is negative for GPA and positive for gender and father's education. In other words, females and students with more educated fathers generally have higher scores on the Methodology of Teaching, while students with higher GPAs generally have slightly lower scores on this dimension.

The second panel of Table 14 reports the canonical correlation analysis for the items measuring the Development of Pupils dimension. These items all load in a consistent manner above 0.30. The canonical correlation coefficient of 0.64 indicates that approximately 41 percent of the variance between the two variates overlap. The redundancy score is also low. These items exhibit a positive relationship with GPA and father's education, and a negative relationship with gender. In other words, students with higher GPAs and more educated fathers generally have higher scores on this dimension, while females generally have lower scores than males.

In the third panel of Table 14 two analyses of the proposed measures of the Subject Expertise dimension are reported. The first analysis indicates that Item 15 has a relatively low loading and it is the opposite sign to the loading of the other items. This finding supports the results of the p^2 analysis. Consequently, Item 15 was dropped and the items were reanalyzed. The results of this analysis are reported in the second column and illustrate that all the items have relatively consistent loadings on the variate. Moreover, the canonical correlation has increased from 0.47 to 0.65, and now explains approximately 42 percent of the overlapping variance. Similarly, the redundancy score is low. Finally, on the Subject Expertise dimension, scores are generally lower for students with more educated fathers, and are generally higher for females and students with higher GPAs.

Summary

In this chapter we have reported the results of the construct validity testing of the items which were designed to measure the cognitive domain of the quality of life of university students. We began with six dimensions of this domain which were related to the stages of student learning, but we could not find empirical support for this conceptualization. This led us to generate a reconceptualization of the cognitive domain into three dimensions based on the content of the material that students were learning. These content-based dimensions were specific to the experience of the faculty of education students who were sampled in this research. The three dimensions were identified as the Methodology of Teaching, Development of Pupils, and Subject Expertise dimensions.

The objective of construct validity testing is to create unidimensional scales. From an original set of 25 items, these procedures helped us select 12 items that created scales with a minimal amount of non-random error. Given these rigorous procedures, we are confident that these three scales are quite valid. Each of the scales contains four items, which is similar to previous research reported by Piazza (1980, p. 602). Moreover, the alpha reliability coefficients

measuring the internal consistency of the items within each scale are strong. Specifically, the reliability coefficient for Methodology of Teaching is 0.75, for Development of Pupils it is 0.73, and for Subject Expertise it is 0.72. All of these coefficients are above the levels recommended for research purposes (Singleton, et al., 1988).

This completes our description of the procedures and reporting of the results of our attempt to create scales which measure the cognitive and affective domains of the quality of university student life. The final chapter summarizes the results of this project and draws some conclusions about directions for future research in this area.

CHAPTER 6

CONCLUSION

The goal of this research project was to develop a valid set of scales, in both the cognitive and affective domains, for measuring the quality of life of university students. Moreover, in pursuing this goal, we attempted to illustrate the usefulness of Piazza's (1980) procedures for constructing valid scales in educational research. We think that these objectives have been achieved. In this chapter we summarize and discuss the results of our research.

Summary

Chapter 1 set the broad context in which this research is situated. In this chapter the history and meaning of the term "quality of life" were introduced and the relevance of conceptualizing and measuring the quality of life of university students was justified. Moreover, previous research on the quality of life of students was reviewed. From this review, it was apparent that few research scales existed for measuring this property among university students. The conclusion of this chapter was that there is a need to develop instruments to measure the quality of life of university students.

This exploratory investigation required a theoretical framework, and Chapter 2 provided this in the form of a model containing two dimensions. The model was theoretically linked to socialization theory and effective teaching theory, and identified two domains, the cognitive domain and the affective domain, as being the fundamental characteristics of teaching and learning in universities. As a first approximation, six dimensions of each of these domains were specified and justified in terms of previously developed theoretical arguments (Bloom et al., 1956; Williams & Batten, 1981).

With this theoretical framework in place, Chapter 3 discussed several issues related to testing these ideas. The details of selecting representative samples of undergraduate and graduate students from a faculty of education were presented. Additionally, the methodology that was to be used for assuring that the items had content validity was reviewed. With this understanding in place, the empirical testing and results became the focus of the next two chapters.

In Chapter 4 Piazza's techniques were used to measure the content validity of the items in the affective domain. Since Piazza's techniques are quite new and unfamiliar to most educational researchers, we provided a detailed rationale for each of the procedures. Our analyses illustrated that the Affective Domain is composed of four dimensions, Positive Affect, Interaction with Students, Interaction with Professors, and Negative Affect.

Chapter 5 applied Piazza's procedures to assess the construct validity of the items in the Cognitive Domain. The initial tests indicated that our original conceptualization of this domain was deficient. After reconceptualizing the domain, we identified three dimensions, the Methodology of Teaching, the Development of Pupils, and Subject Expertise, that had empirical support.

In short, in this study we have been able to create a set of valid scales for measuring the cognitive and affective components of the quality of life of university students. The specific items included in the final scales are reported in Tables 15 and 16. For research purposes, the items should be prefaced by the introductory statements reported in Chapter 3, and include the five response categories, definitely agree, mostly agree, neutral, mostly disagree, and definitely disagree.

TABLE 15

**Final Items Selected To Measure The Cognitive
Domain Of The Quality Of Life Of University Students**

Methodology of Teaching Dimension

- A considerable amount about the methodology of teaching.
- To evaluate the academic performance of students.
- To use a variety of teaching strategies.
- To combine various teaching techniques.

Development of Pupils Dimension

- The professional responsibilities of teachers.
- A considerable amount about the psychological development of children.
- A considerable amount about the socio-emotional development of children.
- To evaluate the socio-emotional performance of students.

Subject Expertise Dimension

- A considerable amount about the subject I plan to teach.
 - To write in a precise manner.
 - To synthesize various perspectives in the subjects I plan to teach.
 - To combine information from a number of sources.
-

TABLE 16

**Final Items Selected To Measure The Affective Domain
Of The Quality Of Life Of University Students**

Positive Affect Dimension

- The things I learn are important to me.
- People look up to me.
- I really get involved in my work.
- I like learning.
- I enjoy being.
- I have acquired skills that will be of use to me.
- The things I learn will help me in my life.
- I am given the chance to do work that really interests me.
- The things I am taught are worthwhile learning.
- I really like to go each day.
- The work I do is good preparation for my future.
- I have learned to work hard.
- I find that learning is a lot of fun.

Interaction with Students Dimension

- I find it easy to get to know other people.
- Mixing with other people helps me to understand myself.
- People think a lot of me.
- Other students accept me as I am.
- I get on well with the other students in my class.

Interaction with Professors Dimension

- Professors treat me fairly.
- Professors give me the marks I deserve.
- I achieve a satisfactory standard in my work.
- People care about what I think.
- Professors take a personal interest in helping me with my work.
- I am treated with respect.
- Professors help me to do my best.
 - Professors are fair and just.
 - Professors listen to what I say.

Negative Affect Dimension

- I feel depressed.
 - I feel restless.
 - I get upset.
 - I feel worried.
-

Discussion

In discussing this research, there are several points that deserve elaboration. First, although all the scales we have identified as being indicators of the quality of life of university students have been assessed on a number of validity tests, and all of the scales have high reliabilities, it is disappointing to note that the cognitive scales are restricted to students in a faculty of education. The original intention was to develop scales that would apply to all university students, even though the testing was specific to students from a faculty of education. Nevertheless, we believe that this goal was achieved for the scales defining the affective domain. Despite the setback in the cognitive domain, the fact that scales of relatively high quality were created in an exploratory study is a considerable accomplishment.

However, because this is an exploratory study, it is important to remember that the data we have reported are all the evidence that exists to support these scales. Given the limitations of any one study, the credibility of these scales needs to be confirmed by additional research. Specifically, two kinds of studies should constitute the next steps. First, the scales for both the cognitive and affective domains need to be tested on students in other faculties of education. In fact, research of this sort is already under way (see Bulcock, Mendoza, Crane & Lee, 1990); however, other such investigations are required. Second, the contention that the scales identifying the affective domain are not only relevant for students in faculties of education needs to be tested on students from other faculties. The authors are presently investigating the feasibility of this project in one university but, again, other such tests are required.

It is clear that the scales measuring the affective domain are superior to those measuring the cognitive domain. This superiority is evidenced in their applicability to students in more than one faculty, in the number of items that are available to identify most of the dimensions, by the greater percentage of original items that are selected for the final scale, and by the higher reliability coefficients for each of these dimensions. The differences in the quality of the two scales results from the fact that the items in the affective domain were developed from existing quality of life scales, while the items in the cognitive domain were not. Here the benefit of building on previous research is evident. Williams and Batten's (1981) work went through various versions that were corrected through empirical testing. Moreover, the Positive and Negative Affect dimensions identified by Williams and Batten are global quality of life properties with extensive empirical support in the general quality of life literature. In short, the construction of our scales for the affective domain had the advantage of direction from the general quality of life literature and William

and Batten's specific research done in an educational setting. The cognitive domain scales were constructed without this kind of cumulative experience and, not surprisingly, are less robust.

Despite these limitations, we believe the cognitive domain scales are a good first approximation that deserve further inquiry. The theoretical rationale for a domain of this type still seems plausible, and the reconceptualization of the domain for students in a faculty of education was empirically supported. In the quest for a more general measure of the quality of life of university students in the cognitive domain, future research projects need to either generate new items that are more appropriate for specifying the dimensions of this domain as they were originally identified or, alternately, construct new dimensions and measures for this domain using a different theoretical scheme.

Although there is a clear need for further research, we are confident that the scales developed in this study constitute a significant advance toward measuring the quality of university student life in a reliable and valid manner. Besides this substantive product, this investigation was also interested in demonstrating the utility of the process of scale construction recommended by Piazza (1980). Recently, several sophisticated techniques have been used to enhance the construct validity of research instruments. Although these procedures are primarily used by psychologists (e.g. Jackson, 1981; Gibson & Dembo, 1984), sociologists are also showing greater concern for the construct validity of their instruments (e.g. Burt, Wiley, Minor & Murray, 1978; Williams & Batten, 1981). On this account, Piazza's techniques are useful for social and educational researchers developing attitudinal scales such as quality of life instruments.

Although the use of more sophisticated construct validity tests is increasing, social and educational research scales are often created using a three step procedure which includes establishing the content validity of items, factor analyzing the items to determine if they load on a common factor, and calculating reliability coefficients. At an early stage of our research we subjected the original items constructed by the judges for each dimension of the two domains to these procedures. The results showed that the scales for each dimension had content validity, loaded on a single factor, and had high reliability scores. In short, based on these assessments, we would have concluded that our proposed measures were empirically sound and reflected a plausible theoretical framework.

The results of Piazza's validity testing procedures proved otherwise. These tests resulted in substantial theoretical revision to the affective domain and a complete reconceptualization of the cognitive domain. Moreover, only 78 percent of the original set of 40 items measuring the affective domain were

retained in the final scale, and only 48 percent of the original 25 items measuring the cognitive domain were kept. These results suggest that Piazza's construct validation procedures can help create instruments with clearer meaning. In social and educational research, where vague conceptual and operational definitions often lead to high unexplained variance and ambivalent interpretations, these scale construction procedures are recommended.

Now that the reliability and validity of these scales for measuring the cognitive and affective domains of the quality of life of university students has been established, some suggestions for their use in pure and applied research may be identified. In pure research, these scales may be used as either independent or dependent variables. As independent variables, the contribution of these scales to the explanation of "educational attainment" is an important topic for further investigation. Recent research notes that when variables including socio-economic status, time usage, university background, and social psychological attributes are used to account for educational expectations and achievement, over half of the variance remains unexplained (Etcheverry, et al., 1990). The quality of life of university students, as a set of intervening variables, may contribute to a more complete understanding of educational attainment. This is important because, in modern societies, there is a positive relationship between educational attainment and occupational success (Goyder, 1990).

In addition, variation in the quality of life of university students needs to be explained. For instance, the contribution of various factors to cognitive and affective quality of life scores could be used to investigate whether there are important differences in the quality of university life experienced by students of different ages, genders, social classes, and ethnic groups. If specific groups are disadvantaged in this regard, then appropriate remedial interventions could be considered.

The suggestion of social intervention introduces the possibility that these quality of life scales may be useful in evaluation research. Evaluation research has three roles, including diagnostic, formative, and summative evaluation, that correspond to specific types of research (Mason & Bramble, 1989; Scriven, 1967; Bloom, Hastings, & Madaus, 1971). Our quality of university student life scales are potentially useful on each of these roles. Diagnostic research, for instance, is concerned with describing the existing conditions in an organization, which allows policy makers to assess the need for specific interventions. In fact, this study was developed for this purpose and proved useful in giving administrators an assessment of the student body (Clifton, et al., 1987). Formative evaluation occurs after diagnostic research has established the

need for policy changes and remedial programmes have been implemented. The purpose of formative evaluation is to assess how ongoing interventions are working so that appropriate modifications can be made. In other words, after a baseline measure is established, formative evaluation indicates whether the process of change is having the desired effect. Our quality of university student life measures appear relevant for this purpose and a study of this sort is under negotiation. Finally, these scales are useful for summative evaluations. As universities are increasingly held accountable for the standard of service they offer to students, these scales may be used to determine the effectiveness of these institutions at achieving acceptable levels of the quality of life for students.

In Chapter 2 we argued that because students are major stakeholders in universities, information about their quality of life within the institution is relevant for designing improvements to the system. Throughout this monograph we have presented a variety of formal arguments and quantitative evidence supporting the validity of our scales for measuring the quality of life of university students. This conclusion can be supplemented by informal, qualitative evidence supplied by students who participated in the study. This evidence came in the statements that students made at the end of the questionnaire in response to an open-ended invitation to share additional comments or suggestions.

The students' responses to this invitation amounted to over five hundred pages of commentary. A content analysis of this material revealed two things. First, the students had many constructive criticisms to offer about the nature of their university experiences and how it could be improved. Second, there were repeated indications that completing the quality of life instrument was a meaningful and important experience for these students. The following comments were typical:

- The questions were very appropriate!
- I do feel this questionnaire is of importance. Thank you!
- I do feel this is a very good survey.
- I was glad to have the opportunity to complete this survey. I feel that it is very well thought out — the questions were relevant.
- I am happy that such a questionnaire is being circulated. It cannot but better the quality of education offered and the kinds of teachers produced.

These kinds of unsolicited, informal responses of appreciation complement the formal evidence presented in this monograph, and support the conclusion that the scales we have developed are valid and meaningful. As universities are scrutinized by students, parents, and members of the business and professional communities, it is becoming increasingly clear that the quality of life of university students is a relevant issue. For example, in Canadian and American universities about thirty percent of all first year students do not return for a second year of study at the same institution (Office of Institutional Analysis, 1990; Beal & Noel, 1980). Furthermore, some research suggests that these low retention rates are more affected by the nature of the students' experience in the institution (i.e. their quality of life) than by their poor academic performances or financial problems (Levitz & Noel, 1989). Findings like these are making quality of life a central consideration in recent educational investigations and programmes. For instance, the recent Association of Universities and Colleges of Canada commission of inquiry into the quality and relevance of education at Canadian post-secondary institutions is taking into consideration the quality of university student life. Similarly, in both Canada and the United States, a social movement, called the Freshman Year Experience, is attempting to improve the means of connecting students to their universities and colleges so that their retention and achievement rates will improve (Upcraft, Gardner & Associates, 1989).

In short, there is a growing sensitivity to the experience of students at universities and other post-secondary institutions. This attention to students' experiences is justifiable on humanistic, political, and educational grounds. The scales we have developed in this study are a theoretically informed and empirically verified means of measuring the quality of life of university students. As such, our scales represent a significant step toward codifying this important aspect of effective higher education. We hope that this step will serve as an impetus for further investigations.

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